

6/27/93

128849

FINAL DESIGN REPORT

VOLUME III

- APPENDIX D** - **Design Calculations and Specifications,
Groundwater Treatment System**
- APPENDIX E** - **Permit Application Forms**
- APPENDIX F** - **Air Emissions and Dispersion Modeling Protocols**

**Summit National Superfund Site
Deerfield Township of Portage County, Ohio**

PRINTED ON

MAY 27 1993

VOLUME III

VOLUME III

- # Summit National Superfund Site
- ## Deerfield Township of Portage County, Ohio

This report printed on recycled paper

CONESTOGA-ROVERS & ASSOCIATES

APPENDIX D

DESIGN CALCULATIONS AND SPECIFICATIONS
GROUNDWATER TREATMENT SYSTEM

APPENDIX D

TABLE OF CONTENTS

SECTION	CONTENTS
1	MASS BALANCE CALCULATIONS
2	PIPE AND PUMP DESIGN CALCULATIONS
3	PROCESS EQUIPMENT
4	BUILDING DESIGN

SECTION 1

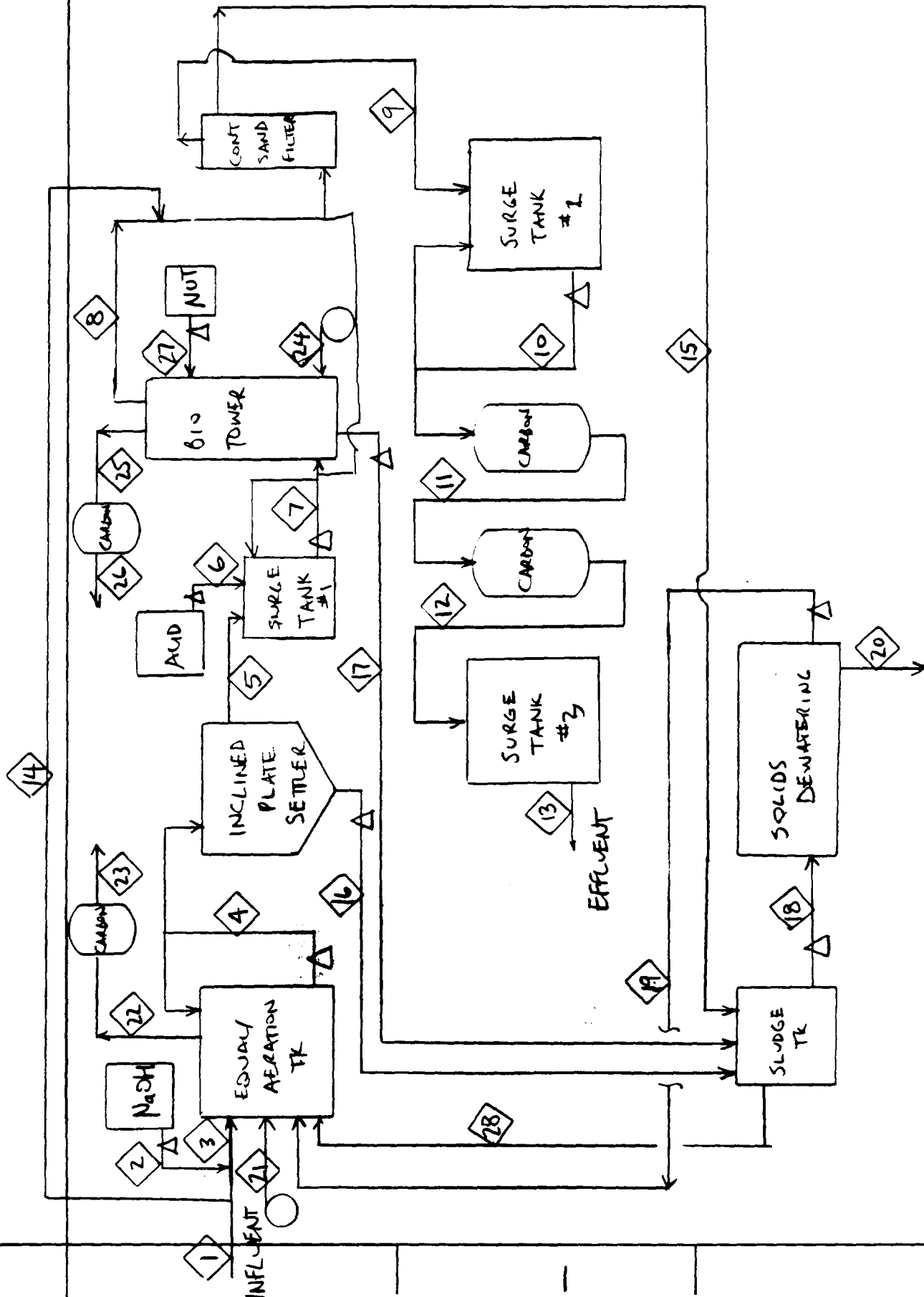
MASS BALANCE CALCULATIONS GROUNDWATER TREATMENT SYSTEM

**MASS BALANCE CALCULATIONS
GROUNDWATER TREATMENT SYSTEM
SUMMIT NATIONAL SUPERFUND SITE**

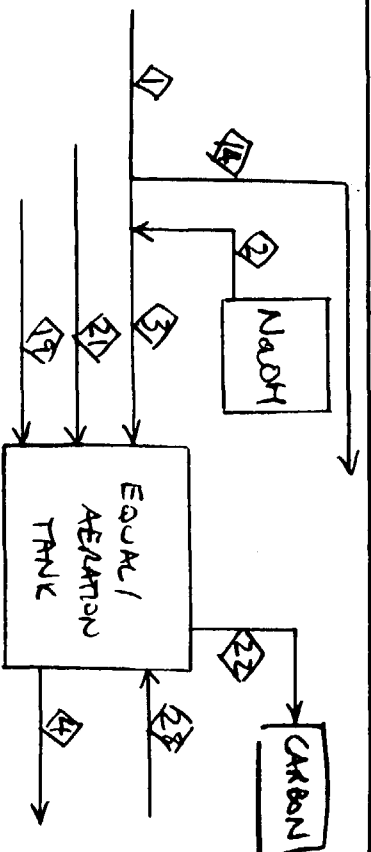
TABLE OF CONTENTS

	<u>Page</u>
PROCESS FLOW DIAGRAM	1
NAOH ADDITION AND EQUALIZATION AERATION TANK	2
INCLINED SETTLER AND SURGE TANK #1	5
BIOTOWER	7
SAND FILTER AND SURGE TANK #2	10
CARBON ADSORBERS AND SURGE TANK #3	12
SLUDGE TANK AND SOLIDS DEWATERING	14
CONVERSIONS	17

PROCESS FLOW DIAGRAM SUMMIT NATIONAL



2372-10



all units
in lbs/day

9/11/92

1,2 DCA	.5	.5	.5	.45	.05		
1,2 DCE	.6	.6	.5	.5	.1		
ACETONE	23	23			23		
MEK	11	11			11		
MIBK	.5	.5			.5		
Fe	75	75	*16.5		75		
Ca	232.5	232.5	29		232.5		
Mg	72.5	72.5	7.5		72.5		
Air			10,800	10,800			
H ₂ O	109,584	1344	503,328	26,581	566,000	577,600	35,882
NaOH		242					

* Estimated Value

Assumptions

- 90% VOC removed through aeration
- 2:1 Air: Water (cfm: gpm)
- NaOH to bring pH from neutral to 8-10
- Flow in (2) (pH adjustment) is negligible
- Flow in Stream (14) only occurs when Flow in Stream (1) > 500 gpm



Stream	Flow (gpm)	Line Size
①	50-100	3"
②	.113	1"
③	50	2"
④	50	2"
④	50	2"
⑤	2	1"
⑥	100 gpm	2"
⑦	100 gpm	2"
⑧	3	2"

Calculations

1) Equalization / Aeration tank

3000 gal operating volume

$$\frac{3000 \text{ gal}}{50 \text{ gpm}} = 60 \text{ min retention time}$$

2) H-NaOH Addition in lab add 12 ml of 1N caustic used to adjust 100 ml of groundwater

$$\frac{12 \text{ ml} \times 42 \text{ gpm} \times 3.78 \frac{\text{L}}{\text{gal}}}{1000 \frac{\text{ml}}{\text{L}}} \times 40 \frac{\text{g}}{\text{L}} = 76.2 \frac{\text{g}}{\text{min}} \times 60 \frac{\text{min}}{\text{hr}} = 24 \frac{\text{kg}}{\text{day}}$$

$$= 110 \frac{\text{kg}}{\text{day}} = 242 \frac{\text{#}}{\text{day}} \text{ solid NaOH}$$

$$1970 \text{ soln} = \frac{242}{1.18} = 1344 \frac{\text{#}}{\text{day}} \text{ H}_2\text{O needed for pH adjustment}$$

3



22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS

3) Carbon

5-8% pick up

.5#/day organics

2000# carbon

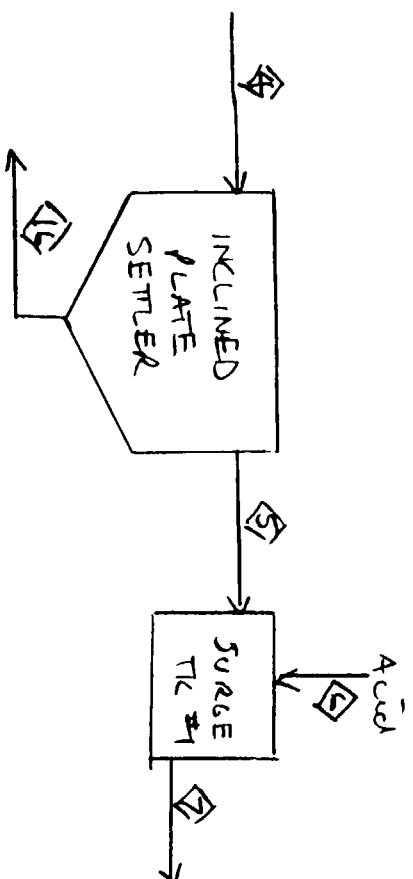
$$(0.05) \frac{2000}{.15} = 2105 (.05) = 105 \text{ days}$$

$$\frac{2100 \text{ ft}^3}{100 \text{ ym}} = 1 \text{ min} \approx 60 \text{ sec contact time}$$

min



22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS



	14	5	7	14
1,2 DCA	.05	.05	.05	
1,2 DCE	.1	.1	.1	
ACETONE	23	23	23	
MEK	11	11	11	
MIX	.5	.5	.5	
Fe	75	30	30	45
Ca	202.5	121.5	121.5	81
Mg	72.5	58	58	14.5
H ₂ O	546,000	566,000	566,600	2670
Acid				663

Assumptions

60% Fe removed, 40% Ca, 20% Mg
Acid is strong pH=7

Steam
④ 50
⑤ 50
⑥ .04
⑦ 50
⑧ 10

Flow (gpm)

Line Size

2" 2" 1" 2" 2"

both pump out
(0.22 gpm each)*

$$* \text{gpm} = 2.670 \text{ pounds per day } H_2O \times 8.2 \text{ pounds per gallon} \times \frac{1}{24} \text{ hours per day} \times 60 \text{ minutes per hour} = 0.22$$

Calculations

1) Acid Addition (10N) 1000 ml of acid needed to neutralize 1000 ml of pH=10 water in 8 hr

$$47 \text{ gpm} \times 3.788 \frac{\text{L}}{\text{min}} \times \frac{1 \text{ m}^3}{1000 \text{ L}} = 1.78 \frac{\text{L}}{\text{min}} (1\text{N}) = 0.178 \frac{\text{L}}{\text{min}} (10\text{N})$$

$$0.178 \frac{\text{L}}{\text{min}} \times \frac{1}{3.788} \times 60 \frac{\text{min}}{\text{hr}} \times 24 \frac{\text{hr}}{\text{day}} \times 9.74 \frac{\text{g}}{\text{L}} = 663 \frac{\text{g}}{\text{day}}$$

$$8.4 \times 1.16 = 9.74 \frac{\text{g}}{\text{L}}$$

2) Sludge

$$45 + 81 + 14.5 = 140.5 \frac{\text{g}}{\text{day}}$$

$$570 \text{ soln } \frac{140.5}{.05} = 2810 \frac{\text{g}}{\text{day}} H_2O \text{ solids}$$

$$2810 - 140.5 = 2670 \frac{\text{g}}{\text{day}} H_2O$$

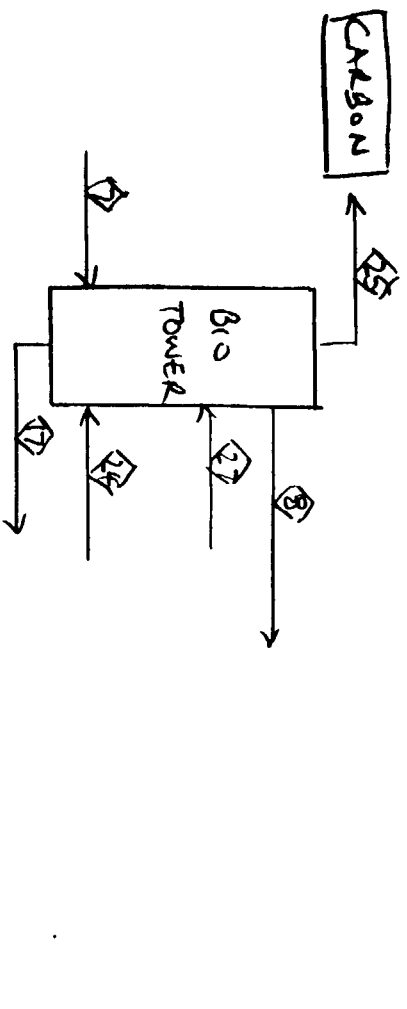
3) Sludge Tank #1

1500 gal operating volume

$$\frac{1500 \text{ gal}}{50 \text{ gpm}} = 30 \text{ min retention time}$$



22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS



1,2 DCA	.05	.05		
1,2 DCE	.1	.1		
ACETONE	23		5	
MEK	11		2	
MIDC	.5		.1	
Fe	30		28.5	1.5
Ca	121.5		115.5	6
Mg	58		55	3
H ₂ O	546,000		567,100	408.5
Biomass			5.5	5.5

AC

18,360

18,360

Assumptions

- 80% organic removed (40% of the acetone, MEK, MIDC converted to biomass and remainder converted to CO₂ and H₂O)
- 5% metals removed
- 95% H₂O in sludge
- 0.1 ppm nut addn (level)
- 100% of 1,2 DCA and 1,2 DCE removed in biotower and vapor phase carbon
- stream 17 batch pumpout (negligible on a continuous basis)
- stream 27 water for nutrients estimated and nutrients consumed in the biotower as energy



Stream	Flow (gpm)	Line Size
①	50	2"
②	50	2"
③	30	2"
④	170-290 gpm	3"
⑤	170-290 gpm	3"
⑥	.1	3/4"

batch pump out *
(0.035 gpm vent)

$$* \text{ gpm} = 408.5 \times \frac{1}{8.2} \times \frac{1}{24} \times \frac{1}{60} = 0.035$$

Calculations

1) Sludge

$$30 + (21.5 + 55)(.05) = 10.5 \#/\text{day} \text{ metals}$$

$$[(23.5) + (11-2) + (5-1)](.4) = 11 \#/\text{day} \text{ biomass} *$$

* 50% of biomass removed in Stream ⑧ and 50% removed in Stream ⑪

21.5 #/day Solids

$$\frac{21.5}{.05} = 430 \#/\text{day} \text{ H}_2\text{O \& Solids}$$

$$430 - 21.5 = 408.5 \#/\text{day} \text{ H}_2\text{O}$$

2) Bioreactor

18,190 gal open vol

$$\frac{18190 \text{ gal}}{50 \text{ gpm}} = 363.8 \text{ min} \approx 6 \text{ hr retention time}$$

8 required for bioreactivity

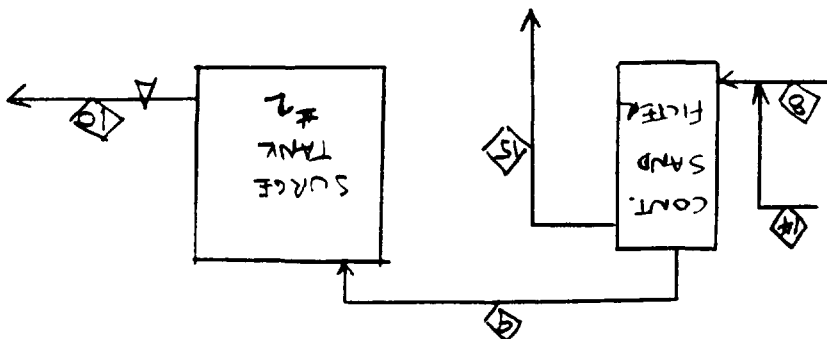
3) Carbon

5-8% pick up

.15 #/day organics

$$\frac{2000}{.15} = 13,333 (.05) = 667 \text{ days}$$

$$\frac{2100 \text{ ft}^3}{170 \text{ gpm}} = .6 \text{ min} = 35 \text{ sec contact time}$$



ACETONE	MEK	MIBK	Fe	Ca	Mg	H ₂ O	BIOMASS
8	2	.1	28.5	115.5	55	567,100	5.5
9	2	.1	8.5	86.5	41	1,164,700	
10	2	.1	8.5	86.5	41	1,104,940	
15			20	29	14	597,600	5.5
14							

Assumption
70% Fe Removal
25% metal removal across sand filter
100% biomass removal
continuous purge at 5% or 5 gpm
Sledge stream free of organics



22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS

<u>Stream</u>	<u>Flow (gpm)</u>	<u>Line Size</u>
13	50	2"
11	50-100	3"
12	50-100	3"
14	50	2"
15	5	2"

Calculations

1) Surge Tank #2

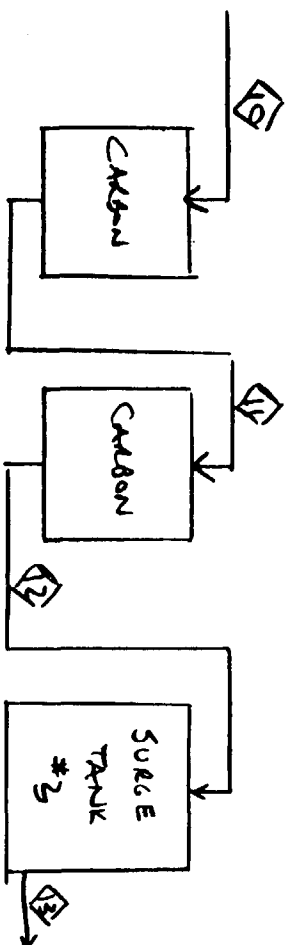
1000gal spec volume

$$\frac{1000\text{gal}}{100\text{gpm}} = 10 \text{ min retention time at } 100\text{gpm}$$

$$\frac{1000\text{gal}}{50\text{gpm}} = 20 \text{ min retention time at } 50\text{gpm}$$



22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS



	19	11	12	13
ACETONE	5	.25	.0125	.0125
MEK	2	.1	.005	.005
MIBK	.1	.005	.00025	.00025
Fe	85	4	2	2
Cu	8.5	82	80	80
Mn	41	39	37	37
H ₂ O	1104940	1104940	1104940	1104940

Assumptions

- 95% organic removal across each contactor
- 5% metals removal
- 50% Fe removal



22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS

Calculations

1) Carbon

S-7th pick up

7th day organic at 50 gpm

$$\frac{20,000}{7} = 2857(.05) = 143 \text{ days at } 50 \text{ gpm}$$

6000 gal each adsorber

$$\frac{6,000}{50} = 120 \text{ min contact time / adsorber}$$

∴ 60 min contact time / adsorber for

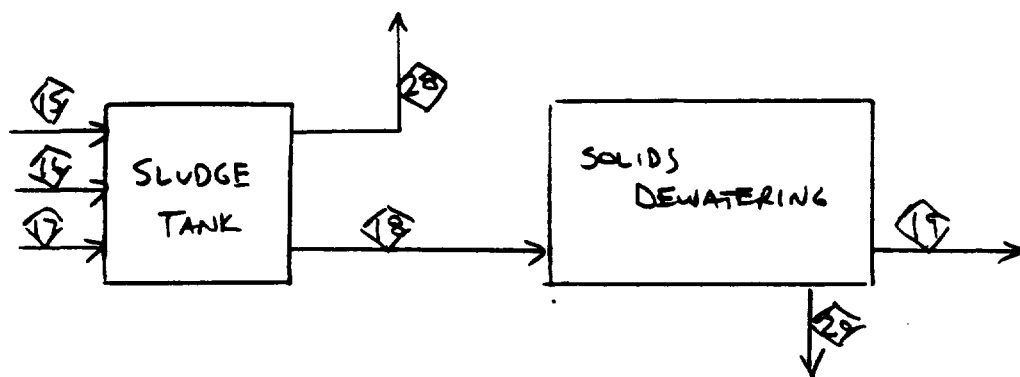
2) Surge Tank #3

1000 gal operating volume

$$\frac{1000 \text{ gal}}{100 \text{ gpm}} = 10 \text{ min retention time at } 100 \text{ gpm}$$

$$\frac{1000 \text{ gal}}{50 \text{ gpm}} = 20 \text{ min retention time at } 50 \text{ gpm}$$

Stream	F (aw c/gm)	Line Size
13	50-100	3"
12	50-100	3"
11	50-100	3"
10	50-100	3"



15 16 17 18 19 29 28

Acetone

MEK

MIBK

Fe	20	45	1.5	66.5	16.5	50
Ca	29	81	6	116	29	87
Mg	14	14.5	3	31.5	7.5	24
H ₂ O	59,760	2670	408.5	26,982	26,581	401
Biomass	5.5		5.5	11		11
						35,850

Assumptions:

70% H₂O, 30% Solids in bags (after 16 hrs holding)

75% metals removal thru dewatering

100% biomass removal thru dewatering

<u>Stream</u>	<u>Flow (gpm)</u>	<u>Line Size</u>	
⑤	5	2"	
④	10	2"	(.22 gpm cont)
⑦	30	2"	(.03 gpm cont)
⑧	45	2"	
⑨	2	1"	
⑩	573 #/day	—	
⑫	3	2"	

Calculations

1) Solids

$$50 + 87 + 24 + 11 + 401 = 573 \quad \frac{\#}{\text{day}} \text{ H}_2\text{O} \# \text{ Solids}$$

$$\frac{172}{573} = 30\% \text{ solids in sludge after 1 day}$$

2) Sludge Tank

~ 3900 gal operating volume

$$\frac{3900 \text{ gal}}{5 \text{ gpm}} = 780 \text{ min} = 13 \text{ hr to fill at full rate}$$

Normal operation: 5 gpm influent, 3 gpm overflow to equal/aerate

$$\frac{3900}{2 \text{ gpm}} = 1950 \text{ min} = 32.5 \text{ hr turnover}$$

3) Assume 20,000 lb limit in roll off
 for study disposal

At worst case 573 lb/day sludge

$$\frac{20,000 \text{ lb}}{573 \text{ lb/day}} = 35 \text{ days to fill roll-off}$$

for shipment

4) Sludge dewatering
 6 bags/day
 dump/month operation

CONVERSIONS

FOR WATER:

$$\text{---} \frac{\text{GAL}}{\text{MIN}} \times \frac{8.3 \text{ LB}}{\text{GAL}} \times \frac{60 \text{ MIN}}{\text{HR}} \times \frac{24 \text{ HR}}{\text{DAY}} = \text{---} \frac{\text{LB}}{\text{DAY}}$$

$$\text{---} \frac{\text{GAL}}{\text{MIN}} \times 11,952 = \text{---} \frac{\text{LB}}{\text{DAY}}$$

FOR INFLUENT WATER:

$$\text{---} \frac{\text{MG}}{\text{L}} \times 3.78 \frac{\text{L}}{\text{GAL}} \times \frac{\text{KG}}{10^6 \text{ MG}} \times \frac{2.2 \text{ LB}}{\text{KG}} \times 42 \frac{\text{GAL}}{\text{MIN}} \times \frac{60 \text{ MIN}}{\text{HR}} \times \frac{24 \text{ HR}}{\text{DAY}}$$

$$\text{---} \frac{\text{MG}}{\text{L}} \times 0.5 = \text{---} \frac{\text{LB}}{\text{DAY}}$$

FOR AIR:

$$\text{---} \frac{\text{FT}^3}{\text{MIN}} \times 0.075 \frac{\text{LB}}{\text{FT}^3} \times \frac{60 \text{ MIN}}{\text{HR}} \times \frac{24 \text{ HR}}{\text{DAY}} = \text{---} \frac{\text{LB}}{\text{DAY}}$$

$$\text{---} \frac{\text{FT}^3}{\text{MIN}} \times 108 = \text{---} \frac{\text{LB}}{\text{DAY}}$$

SECTION 2

PIPE AND PUMP DESIGN CALCULATIONS GROUNDWATER TREATMENT SYSTEM

GROUNDWATER TREATMENT PLANT

PIPE AND PUMP DESIGN

1) Discharge of Pump P2

Maximum expected flow 50 gpm - 2" ϕ pipe

TDH

Vertical lift 10 ft
- inlet to settler

friction losses 7 ft

- 25 ft of pipe

- 3-90° 3 x 5

1-tee 1 x 10

3-valves 3 x 9.5

1-check valve 1 x 17

2-outlet 2 x 5

TOTAL 95.5

$$\frac{2.87 \text{ PSI}}{100 \text{ ft}} \cdot 95.5 \text{ ft} + \frac{2.3 \text{ ft}}{\text{PSI}} = 6.3 \text{ ft}$$

misc losses 5 ft
22 ft

Pump selection

G&C close-coupled centrifugal pump, Model 3642

flow range 40-80 gpm, Max TDH 75 ft at 50 gpm



2) Gravity discharge from attler to Surge Tank #1
Maximum range: 151 ft from 50 gpm - 4" x pipe

TDH

Vertical lift

0 ft

friction losses

.03 ft

- 6 ft² pipe

- 2-90° 2x3

- 1-outlet 1x3

$$\frac{.076 \text{ psi}}{100 \text{ ft}} \times 15 \text{ ft} \times \frac{2.3 \text{ ft}}{\text{psi}} = .03$$

misc losses

$\frac{2 \text{ ft}}{2 \text{ ft}}$

3) Discharge from pump P3

- Maximum expected flow 50 gpm - 2" x pipe

TDH

Vertical lift

24 ft

- discharge to distance (upflow)

friction losses

12 ft

- 60 ft pipe

4-90°

4x5

3-tee

3x10

4-Valves

4x9.5

1-Check values 175
 2-outlet 2 x 5
 TOTAL 175

$$2.37 \text{ psi} \cdot \frac{175 \text{ ft} \cdot 2.37 \text{ ft}}{\text{psi}} = 11.5 \text{ ft}$$

max. losses 10' +
 46 ft

Pump selection
 Duce Make III 1K 1.5 x 1-6.2 RV centrifugal
 pump, flow range 20-100 gpm, 50 gpm
 at 50 ft head

4) Gravity discharge from bottom to sand filter

maximum expected flow 100 gpm from by pass
 - 4" pipe
 Bottom outlet elev 22 ft
 Sand filter outlet elev 12 ft
 difference 10 ft

max head loss across filter is 30" $\approx 3 \text{ ft}$

$\therefore 7 \text{ ft available}$

~35 ft of pipe
 4-90 4 x 8
 3-Tees 3 x 15
 2-Valves 2 x 15
 1-outlet 1 x 5
 1471

③



Vertical lift 2.0 ft
Friction losses

$$\frac{2272}{100 \text{ ft}} \times 147 \text{ ft} = \frac{36}{15} = 1.0 \text{ ft}$$

min. losses $\frac{10 \text{ ft}}{2.0 \text{ ft}}$

5) Gravity discharge from sand pit to Surge Tank with 2" maximum expected flow 100 gpm - 6" P pipe

Sand pit to effluent elev 12 ft

Surge Tank influent elev $\frac{7.5 \text{ ft}}{4.5 \text{ ft}}$

friction losses
~ 6 ft of pipe

1-90° 1" 10

1-outlet 1" $\frac{5}{21 \text{ ft}}$

$$\frac{0.36 \text{ PSI}}{100 \text{ ft}} \times 21 \text{ ft} - \frac{2.3 \text{ ft}}{\text{PSI}} = 1.02 \text{ ft}$$

Vertical lift = 0.0 ft

min losses = 0.5 ft

$$\frac{0.5 \text{ ft}}{0.5 \text{ ft}}$$

5) Discharge from 190 P10

maximum expected flow 100 gpm total
(50 gpm each)

- 3" x PIPE

TDH

Vertical lift

20 ft

friction losses

6 ft

- 15 ft of pipe

8 - 90° 8 x 8

3 - Tee 3 x 15

3 - Valves 3 x 15

1 - check valves 1 x 20

249

$$\frac{1.05 \text{ PSI}}{100 \text{ ft}} = 249 \text{ ft} - \frac{2.2 \text{ ft}}{\text{PSI}} = 6 \text{ ft}$$

Misc losses

15 ft

41 ft

Pump selection

600 close-coupled centrifugal pumps, Model 3000

flow range 40-80 gpm each, max TDH

75 ft at 50 gpm each



22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS

7) Gravelly thickness to surface - 4" x

Maximum expected flow - 100 gpm

Gravel Tank #3 also 4 ft

vertical lift 0.0 ft

friction losses

~ 33 ft of pipe

1 - 90° 1 x 3
1 - outlet 1 x 5

41 ft

$$\frac{.272}{100 \text{ ft}} \times 41 \text{ ft} \times \frac{2.3 \text{ ft}}{151} = 0.26 \text{ ft}$$

misc losses

$$\begin{array}{r} 2.0 \text{ ft} \\ \hline 2.0 \text{ ft} \end{array}$$

SECTION 3

SECTION 3

PROCESS EQUIPMENT
GROUNDWATER TREATMENT SYSTEM

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-T1</u>
NAME	<u>CAUSTIC STORAGE TANK</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>Highland Tank & Mfg. Company</u> <u>Rd #3, Rte 30</u> <u>Stoystown, Pa</u> <u>814-893-5701</u>
DISTRIBUTOR	<u></u> <u></u> <u></u> <u></u>
DESCRIPTION	<u>3000 gallon steel, flat bottom, dished top</u> <u>76" OD, 10' SSH</u> <u>Painted exterior, epoxy coated interior</u> <u>1/4 in. carbon steel SA-285 gradec minimum</u> <u></u>
MAINTENANCE	<u>inspect for leaks</u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>

NaOH TANK

SYSTEM REQUIRES APPROXIMATELY 6.75 gal/hr of 18% NaOH TO ADJUST THE pH FROM NEUTRAL TO 10 IN THE INFLUENT (42 gpm) STREAM, BASED ON LAB TESTING (SEE MASS BALANCE CALCULATIONS)

$$6.75 \frac{\text{gal}}{\text{hr}} \times 24 \frac{\text{hr}}{\text{day}} = 162 \frac{\text{gal}}{\text{day}} \text{ USAGE}$$

3300 GAL TANK TO GIVE APPROXIMATELY 18 DAYS STORAGE, USING A 3000 GAL OPERATING VOLUME

STEEL TANK

$$7.5 \text{ ft dia} \times 10 \text{ ft SSH}$$

$$\pi \left(\frac{7.5 \text{ ft}}{2} \right)^2 (10 \text{ ft}) \left(7.48 \frac{\text{gal}}{\text{ft}^3} \right) = 3300 \text{ gal}$$

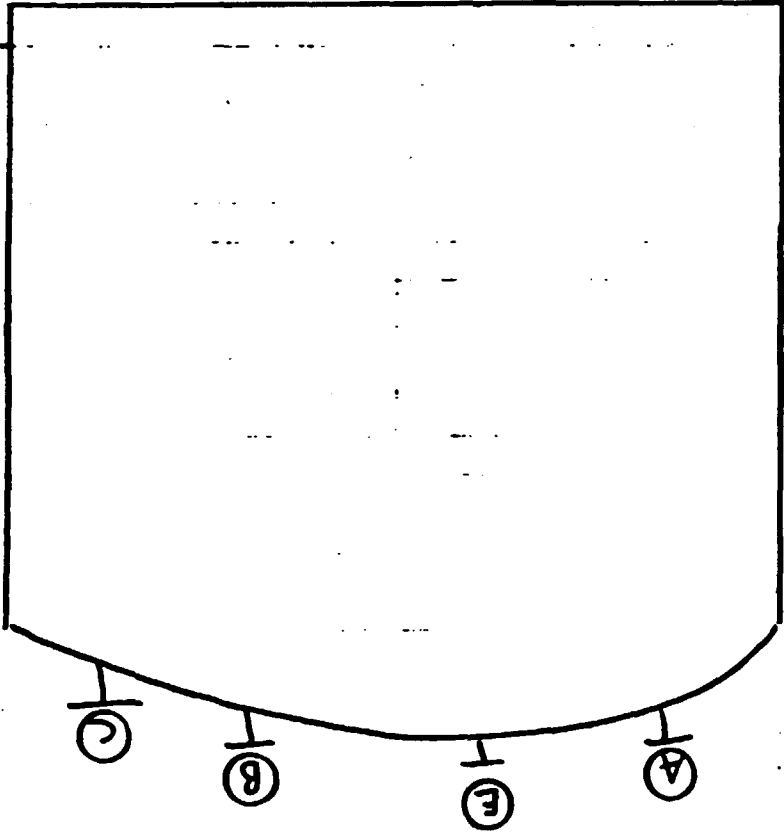


WEIGHT FULL _____
WEIGHT EMPTY _____

7.5'

⑩ ⑨

10'



DESCRIPTION	SIZE	A
INLET	3"	
LEVEL INST.	2"	B
MANWAY	18"	C
PUMP SUCTION	2"	D
DRAIN	2"	E
VENT	3"	F

3000 gal
NAOH STORAGE

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO. SS2-P1

NAME CAUSTIC STORAGE TANK METERING PUMP

LOCATION TREATMENT BUILDING

MANUFACTURER Liquid Metronics Inc. (LMI)
19 Craig Road
Acton, MA 01720-5495
(508) 263-9800

DISTRIBUTOR Stranco
595 Industrial Drive
P.O. Box 389, Bradley, IL 60915-0389
815-932-8154

DESCRIPTION Model D741 Drive
35P wet end
30691 Analog to Digital Converter
115 V

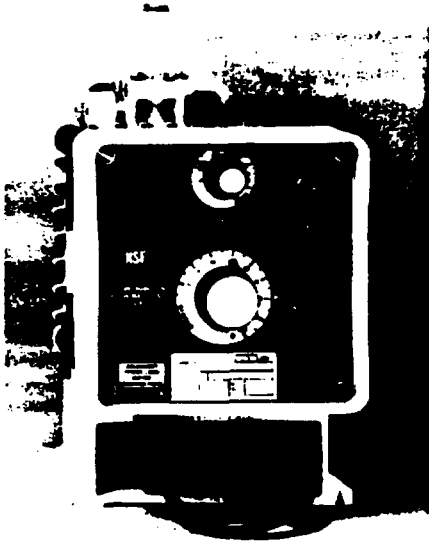
MAINTENANCE _____

COMPONENT PARTS _____

SPARE PARTS _____

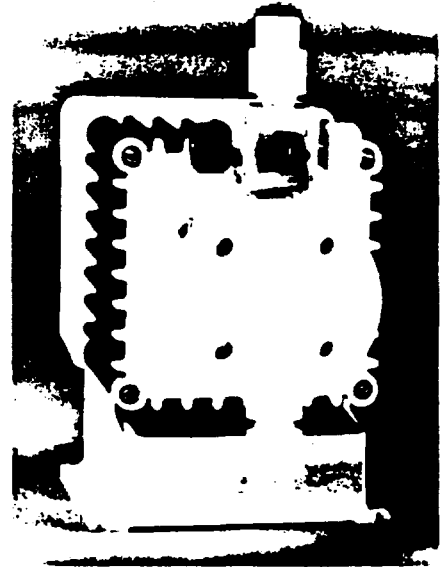
SERIES B and D

ELECTROMAGNETIC METERING PUMPS



■ LMI'S ACCURATE,
DEPENDABLE SERIES B
METERING PUMP—
CONTROL PANEL VIEW

■ LMI'S TOTALLY ENCLOSED,
CORROSION RESISTANT
SERIES D METERING PUMP—
PUMP HEAD VIEW



LMI
LIQUID METRONICS DIVISION
MILTON ROY

2. OUTPUT SPECIFICATIONS

SERIES	GALLONS PER HOUR		LITERS PER HOUR		mL OR CC PER MIN.		OUTPUT PER STROKE		MAX INJECTION PRESSURE
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
B11, B71	.008	1.6	.03	6	0.5	100	1.0	1.0	150 PSI (10.3 Bar)
BE2, B12, B72	.012	2.5	.05	9.5	.79	158	.16	1.58	100 PSI (6.9 Bar)
BE3, B13, B73	.022	4.5	.085	17.0	1.42	284	.28	2.84	50 PSI (3.4 Bar)
B14, B74, BE7	.04	7.0	.13	26.5	2.21	442	.44	4.42	30 PSI (2.07 Bar)
B41*	0.	1.6	0.	6.0	0.	100	.1	1.0	150 PSI (10.3 Bar)
B42*	0.	2.5	0.	9.5	0.	158	.16	1.58	100 PSI (6.9 Bar)
B43*	0.	4.5	0.	17.0	0.	284	.28	2.84	50 PSI (3.4 Bar)
B44*	0.	7.0	0.	26.5	0.	442	.44	4.42	30 PSI (2.07 Bar)
D11, D71	.012	2.5	.05	9.5	.79	158	.21	2.10	150 PSI (10.3 Bar)
DE2, D12, D72	.02	4.0	.76	15.2	1.28	252	.34	3.36	100 PSI (6.9 Bar)
DE3, D13, D73	.04	8.0	.15	30.3	2.51	505	.67	6.73	60 PSI (3.4 Bar)
DE4, D14, D74	.1	20.0	.38	76.0	6.3	1260	1.68	16.8	20 PSI (2.07 Bar)
D41*	0.	2.5	0.	9.5	0.	158	.1	1.02	150 PSI (10.3 Bar)
D42*	0.	4.0	0.	15.2	0.	253	.32	3.16	100 PSI (6.9 Bar)
D43*	0.	8.0	0.	30.3	0.	504	.63	6.3	60 PSI (3.5 Bar)
D44*	0.	20.0	0.	76.0	0.	1262	1.6	15.8	20 PSI (2.07)

*Series B4 and D4 pumps operate from a 4-20 mA signal source. Incoming signal automatically controls pump output from zero to maximum.

3. VOLTAGE CODES

The final digit of each drive assembly number designates both voltage and power cord/plug type. When ordering please indicate desired voltage by inserting one of the following digits in this position.

- | | |
|-----------------------------|--------------------------------------|
| [1] 115 VAC | [5] 240 - 250 VAC, British (UK) Plug |
| [2] 230 VAC | [6] 240 - 250 VAC, Aust./N.Z. Plug |
| [3] 220 - 240 VAC, DIN Plug | [7] 220 VAC, Swiss Plug |

You should now have a complete Drive Assembly part number, such as B721, where B7 indicates the control option you chose in step 1, 2 indicates the output range you require from step 2, and 1 indicates the voltage code you require from step 3.

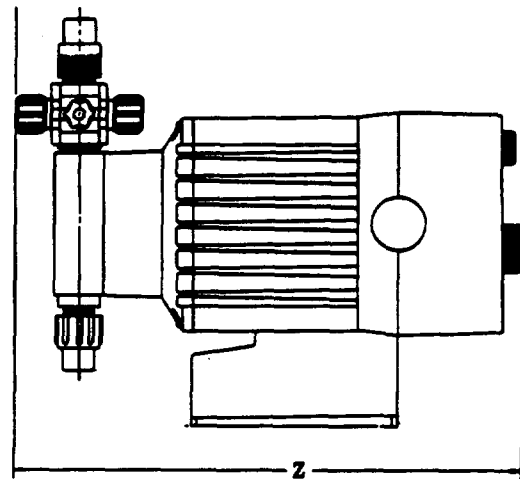
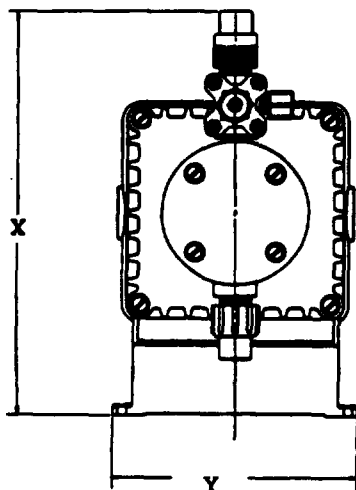
ADDITIONAL SPECIFICATIONS

SERIES	PEAK INPUT POWER (WATTS)	AVERAGE INPUT POWER (WATTS @ MAX SPEED)	STROKE LENGTH ADJUSTABLE (0-100%) RECOMMENDED MIN.	STROKE FREQUENCY ADJUSTABLE (STROKES PER MINUTE)
B11, B71	248	29	15%	5 TO 100
B12, B13, B14	248	29	10%	5 TO 100
B41, B42, B43, B44	248	29	10%	0 TO 100
B72, B73, B74	248	29	10%	5 TO 100
D10, D11, D12, D13, D14	381	33	10%	3.75 TO 75
D40, D41, D42, D43, D44	381	33	10%	0 TO 75
D70, D71, D72, D73, D74	381	33	10%	3.75 TO 75

VOLTAGE: 115 VAC, 50/60 Hz, SINGLE PHASE
230-250 VAC, 50/60 Hz, SINGLE PHASE

DIMENSIONS

SERIES	LENGTH (Z) Inches (mm) MAX	WIDTH (Y) Inches (mm) MAX	HEIGHT (X) Inches (mm) MAX	SHIPPING WEIGHT LBS (Kg)
B1, B7	10.5 (267)	5.72 (146)	8 (203)	15 (6.9)
B4	10.75 (273)	5.72 (146)	8 (203)	15 (6.9)
D1, D7	11.625 (296)	5.72 (146)	9.25 (235)	19 (8.7)
D41, D42	10.75 (273)	5.72 (146)	9.25 (235)	19 (8.7)
D43	11.0 (280)	5.72 (146)	9.25 (235)	19 (8.7)
D44	11.70 (298)	5.72 (146)	9.25 (235)	19 (8.7)



EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-T2</u>
NAME	<u>EQUALIZATION/AERATION TANK</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>Plas-Tanks Industries, Inc.</u> <u>5011 Factory Drive</u> <u>Fairfield, OH 45014</u> <u>513-829-8888</u>
DISTRIBUTOR	<u>K-Tech Assoc.</u> <u>1868 Niagara Falls Blvd., Suite 304</u> <u>Niagara Falls, NY 14150</u> <u>716-695-1038</u>
DESCRIPTION	<u>3800 gallon cap, 3000 gallon operating volume</u> <u>60 minute retention time at 42 gpm</u> <u>FRP-vinyl ester resin</u> <u>flat bottom, dished top</u> <u>8'OD, 10'SSH</u>
MAINTENANCE	<u>Inspect for leaks</u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>

EQUALIZATION / AERATION TANK

TANK REQUIRES 60 MIN RETENTION TIME
FOR AERATION AND pH ADJUSTMENT, AT
50 GPM FLOW

$$50 \text{ gpm} \times 60 \text{ min} = 3000 \text{ gal}$$

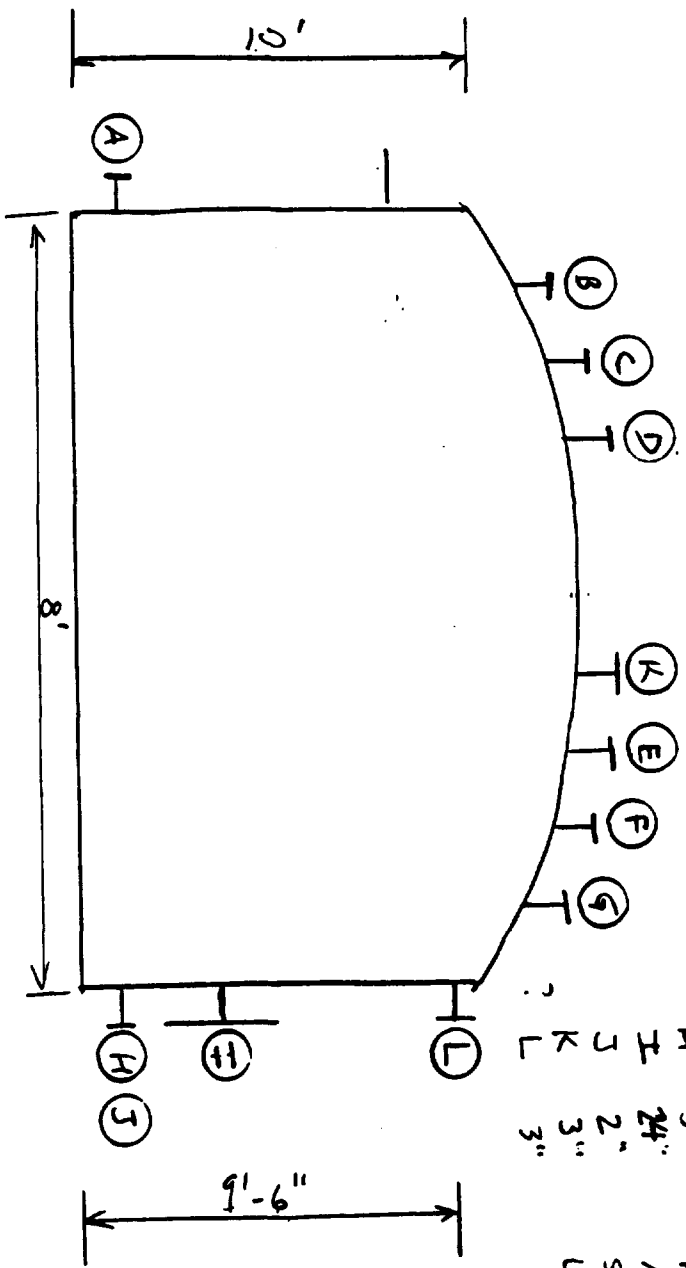
NEED OPEN HEAD SPACE ABOVE LIQUID LEVEL
FOR AERATION DISENGAGEMENT & BUBBLING

FRP TANK

8 ft dia x 10 ft SSH

$$\pi \left(\frac{8 \text{ ft}}{2} \right)^2 (10 \text{ ft}) \left(\frac{7.48 \text{ gal}}{\text{ft}^3} \right) = 3800 \text{ gal}$$

EVALUATION/REACTION TANK
 3800 gal
 60 min retention time



SIZE	DESCRIPTION
2"	Blower Inlet
3"	Water Inlet
1"	NASH Inlet
2"	Filter Press Recycle
2"	Pump Recycle
6"	Vapor Outlet
3"	Space
3"	Pump Suction
24"	Manway
2"	Support for Air Line
3"	Level Inst
3"	Overflow

Wen at 8' level (3000 gal)

WEIGHT EMPTY _____
 WEIGHT FULL _____

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-B1</u>
NAME	<u>EQUALIZATION/AERATION TANK BLOWER</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>EG&G ROTRON</u> <u>North Street</u> <u>Saugerties, NY 12477</u> <u>914-246-3401</u>
DISTRIBUTOR	<u></u> <u></u> <u></u> <u></u>
DESCRIPTION	<u>Regenerative Blower</u> <u>100 cfm at 96" static H2O pressure</u> <u>Model DR6D89</u> <u>5HP, TEFC, 230/460V, 3Ø</u> <u></u>
MAINTENANCE	<u></u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>

DR 6 Regenerative Blower

FEATURES

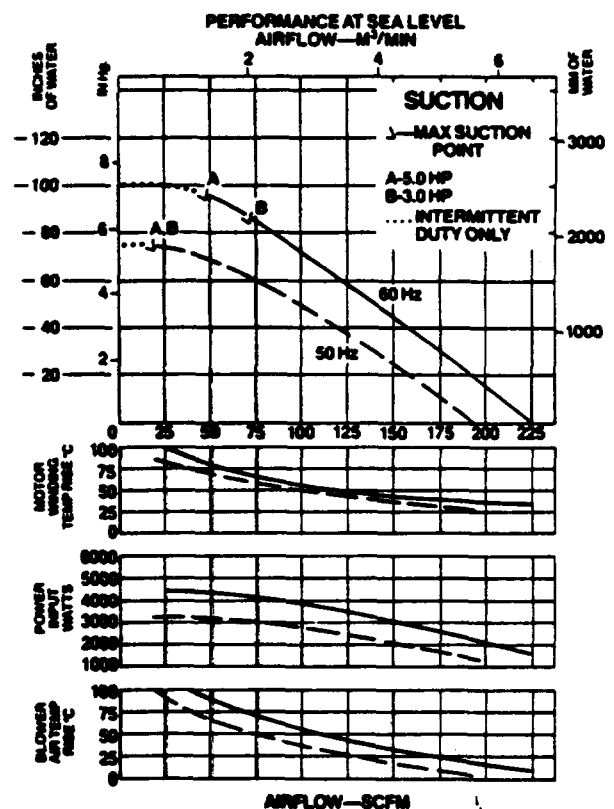
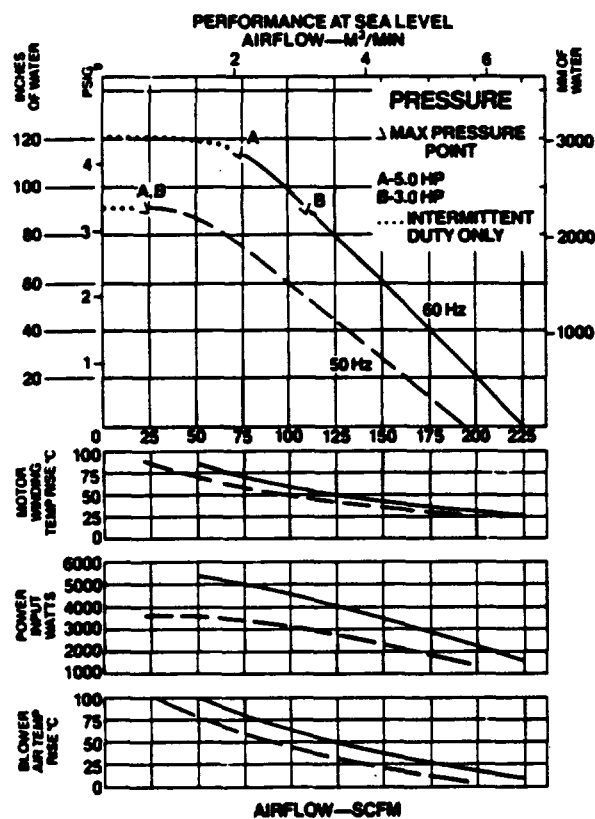
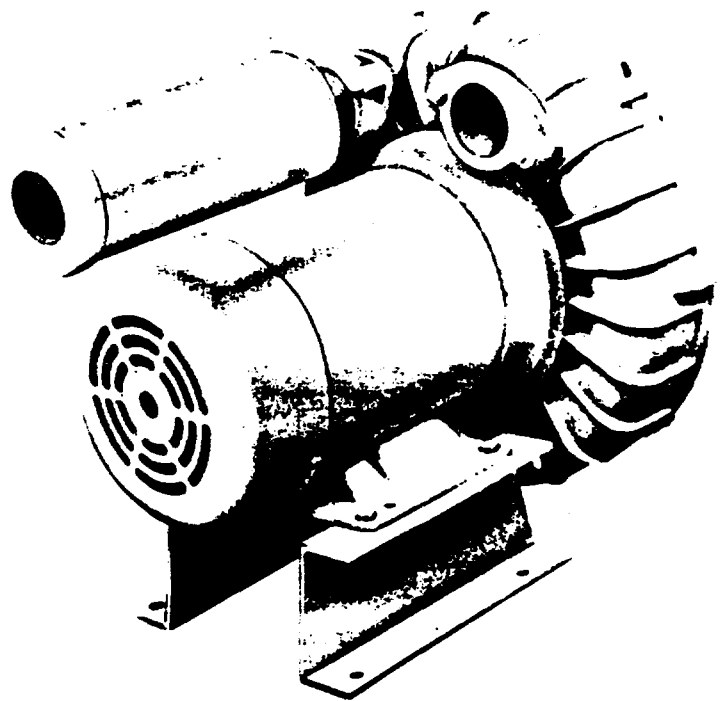
- Manufactured in the USA
- Maximum flow 225 SCFM
- Maximum pressure 120" WG
- Maximum vacuum 7.3" Hg
- 5.0 HP, TEFC motor standard
- Blower construction—cast aluminum housing, impeller and cover
- Inlet muffler
- Noise level within OSHA standards
- Weight: 133 lbs. (60 Kg)

ACCESSORIES

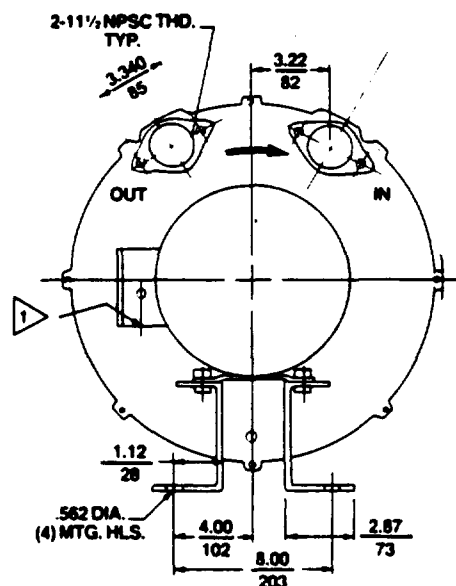
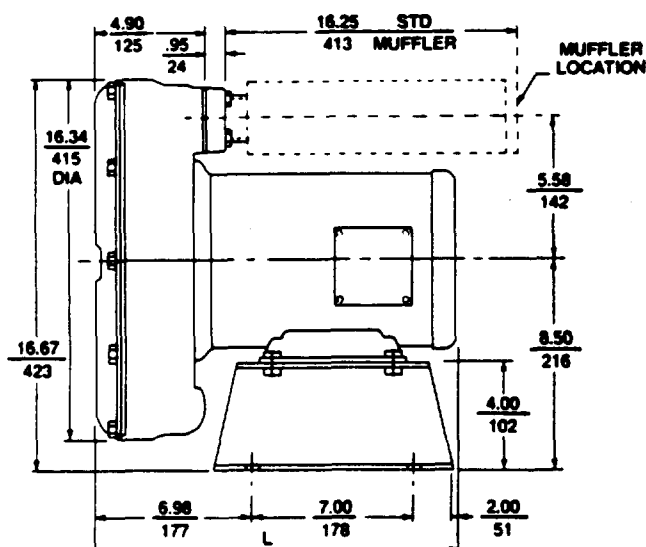
- Additional inlet/outlet silencers
- Inlet filters
- Slip-on flanges
- For details see Accessories Section

OPTIONS

- 3.0 HP motors
- 575-volt and XP motors
- Surface treatment or plating
- Single phase motors(5.0 HP)
- Gas tight sealing
- Belt drive (motorless) model;
for details see Remote Drive Section



DR 6 Regenerative Blower



Model	L(IN) ± .12	L(MM) ± 3
DR6D89	18.06	459
DR6F72	20.37	517
DR6D86	18.06	459
DR6K72	18.06	459
DR6D5	19.56	497

DIMENSIONS: IN
MM

TOLERANCES: .XX ± .06
1.5

1.06 INCH CONNECTOR HOLE ON TEFC MOTOR
.75 INCH PIPE TAP HOLE ON XP MOTOR

Specifications subject to change without notice.

SPECIFICATIONS

MODEL	DR6D89	DR6F72	DR6D86	DR6K72	DR6D5
Part No.	027578	027581	027579	027600	036212
Motor Enclosure Type	TEFC	XP	TEFC	TEFC	TEFC
Motor Horsepower	5.0	5.0	5.0	3.0	5.0
Voltage ¹	230/480	230/480	575	230/460	230
Phase	3	3	3	3	1
Frequency ¹ (Hz)	60	60	60	60	60
Insulation Class ²	F	B	F	F	F
NEMA Rated Motor Amps	14/7	14/7	5.6	8.3/4.15	24.8
Service Factor	1.15	1.0	1.15	1.15	1.15
Locked Rotor Amps	132/68	104/52	68	88/44	124
Max. Blower Amps	14.9/7.45	14/7	6.0	12/6	21.0
Recommended NEMA Starter Size	1/1	1/0	1	1/0	1½
Weight (lbs/Kg)	133	148	133	121	158
Blower Limitations for Continuous Duty (60 Hz/50 Hz)					
Max. Pressure-In. of water	117/90	94/90	117 (60 Hz)	86/80	85 (60 Hz)
Max. Suction-In. of water	92/75	92/75	92 (60 Hz)	84/75	70 (60 Hz)
Min. Flow-Pressure-SCFM	75/20	110/20	75 (60 Hz)	115/20	113 (60 Hz)
Min. Flow-Suction-SCFM	40/20	40/20	40 (60 Hz)	70/20	100 (60 Hz)

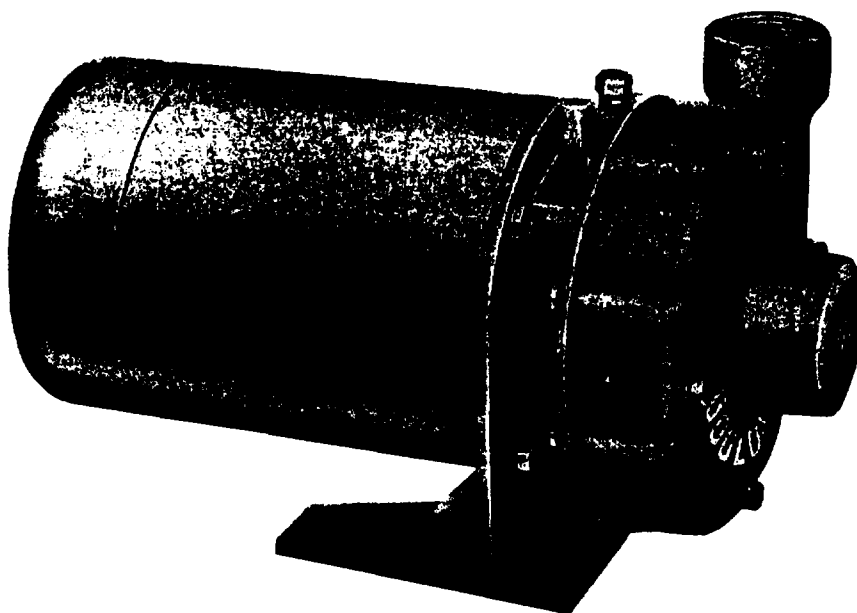
¹All 3 phase motors are factory tested and certified to operate on 200-230/480 VAC-3 ph-60 Hz and 220-240/380-415 VAC-3 ph-50 Hz. All 1 phase motors are factory tested and certified to operate on 115/230 VAC-1 ph-60 Hz and 220-240 VAC-1 ph-50 Hz.

²Maximum operating temperatures: Motor winding temperature (winding rise plus ambient) should not exceed 140°C for Class F insulation or 110°C for Class B insulation. Blower outlet air temperature should not exceed 140°C (air temperature rise plus ambient).

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-P2</u>
NAME	<u>EQUALIZATION/AERATION TANK TRANSFER PUMP</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>G&L Goulds Pumps</u> <u>P.O. Box 330</u> <u>Seneca Falls, NY 13148</u> <u>315-568-2811</u>
DISTRIBUTOR	<u>Pump & Compressor Equipment, Inc.</u> <u>570 Elk Street</u> <u>Buffalo, NY 14210</u> <u>716-823-1504</u>
DESCRIPTION	<u>Close coupled centrifugal pump</u> <u>Model 3642</u> <u>50 gpm at 50' head</u> <u>1 1/4 x 1 1/2-5, 3500 RPM, 1 1/2 HP, 230/460 V,</u> <u>3 phase</u>
MAINTENANCE	<u>Inspect for leaks</u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>



G&L Close- Coupled Centrifugal Pumps

MODEL

3642

APPLICATIONS

Specifically designed for the following uses:

- Water Circulation
- Booster Service
- Liquid Transfer
- Spraying Systems
- Jockey Pump Service
- General Purpose Pumping

SPECIFICATIONS

Pump:

- Capacities to 110 GPM
- Heads to 118 feet
- Pipe connections:

MODEL	SUCTION	DISCHARGE
1 x 1 1/4 - 5	1 1/4" NPT	1" NPT
1 1/4 x 1 1/2 - 5	1 1/2" NPT	1 1/4" NPT

- Maximum working pressure: 125 PSI
- Temperature: standard seal — 212° F, (100° C) maximum. Optional high temperature seal — 250° F, (121° C) maximum.
- Rotation: right hand i.e.; clockwise when viewed from motor end.

Motor:

- NEMA Standard
- Open drip proof, TEFC, or (Explosion proof three phase only) enclosures.
- 60 Hz, 3500 RPM
- Stainless steel shaft
- Single phase: 115/230 volt, 1/3-2 HP ODP, 1/2-2 HP TEFC. Built-in overload with automatic reset.
- Three phase: 1/3-2 HP: ODP, 208-230/460 volt 1/2-2 HP: TEFC, 208-230/460 volt 1/2-2 HP: expl. proof, 230/460 volt
- Overload protection must be provided in starter unit. Starter and heaters (3) must be ordered separately.

FEATURES

Compact Design: Close coupled space saving design provides easy installation. Flexible couplings and bedplates not required.

Mounting: Can be mounted in vertical or horizontal position.

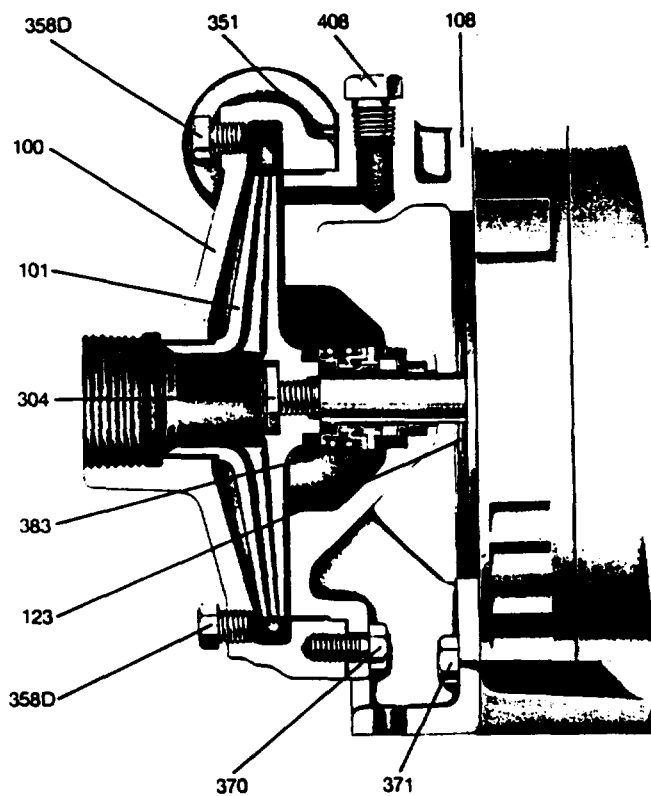
Construction: Available in bronze fitted (BF), all iron (AI), or all bronze (AB). Bronze fitted means bronze impeller.

Impeller: Enclosed design for high efficiencies. Threaded direct on motor shaft. Stainless steel locknut on three phase models, requires no clearance adjustment. Balanced for smooth operation.

Casing: Volute type, cast iron or bronze construction. Back pullout design. Discharge can be rotated eight positions. Vertical discharge standard. Tapped openings provided for priming, venting, and draining.

Mechanical Seal: Standard carbon/ceramic faces, BUNA elastomers, 300 Series stainless steel components. Option seals available.

Motor: Close-coupled design. Ball bearings carry all radial/axial thrust loads. Designed for continuous operation. All ratings are within working limits of the motor.



G&L Close-Coupled Centrifugal Pumps

MODEL

3642

PARTS

Item No.	Part Name	Material					
		Bronze Fitted	All Iron	All Bronze			
100	Casing	1001	1001	1102			
101	Impeller	1102	1001	1102			
108	Adapter	1001	1001	1102			
123	Water Deflector	Rubber or Micarta®					
304	Impeller Nut*	Stainless Steel					
351	Gasket-Casing	Composite					
358D	Pipe Plug 1/4" Vent and Drain	Steel	Steel	Brass			
370	H. HD Cap Screw Adapter to Case	Steel					
371	H. HD Cap Screw Adapter to Motor	Steel					
383	Mechanical Seal						
	10K10	Std.	Service General	Rotary	Stationary	Elastomers	Metal Parts
	10K6		Heavy Duty		Ceramic		
	10K18	Opt.	Hi Temp.	Carbon	Ni-Resist	EPR	18-8 S.S.
	10K24		Chem. Duty			Viton	
408	Pipe Plug-Priming 1/4" NPT		Steel		Brass		

* Impeller nut furnished on 3 phase units only.

MATERIALS OF CONSTRUCTION

Material Code	Engineering Standard
1001	Cast Iron ASTM A48 CL 20
1102	Bronze ASTM B584

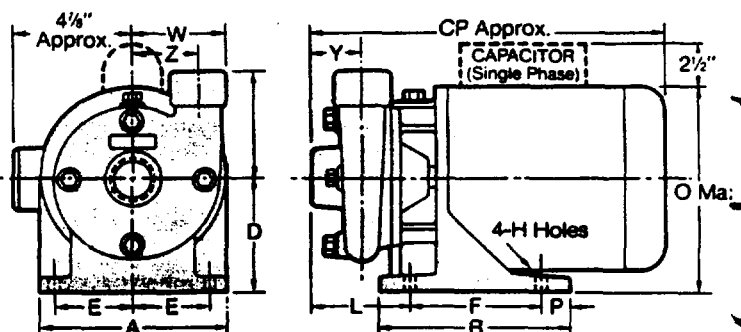
MOTOR FRAME

Motor Frame	1 Phase		3 Phase	
	ODP	TEFC	ODP	TEFC/EXPL
48	1/2	—	—	—
56	1/2-2	1/2-2	1/2-2	1/2-2

DIMENSIONS AND WEIGHTS

Pump	A	B	D	E	F	H	L	O	P	W	X	Y	Z	CP	Motor Frame	Weight (Lbs.)
1 x 1 1/4-5						3 3/4	7					2 1/4	3 1/4	13 1/2	48	55
	6 1/4	5 1/4	4 1/4	2 3/4	5 1/2	7 1/2	1 1/2	4	4					15 1/2	56	67
1 1/4 x 1 1/2-5						3 3/4	7 1/2					2 1/4	3 3/4	15 1/4	56	68

(All dimensions in inches and weight in lbs.)
(Do not use for construction purposes.)



Close-Coupled Centrifugal Pumps

Performance Curve

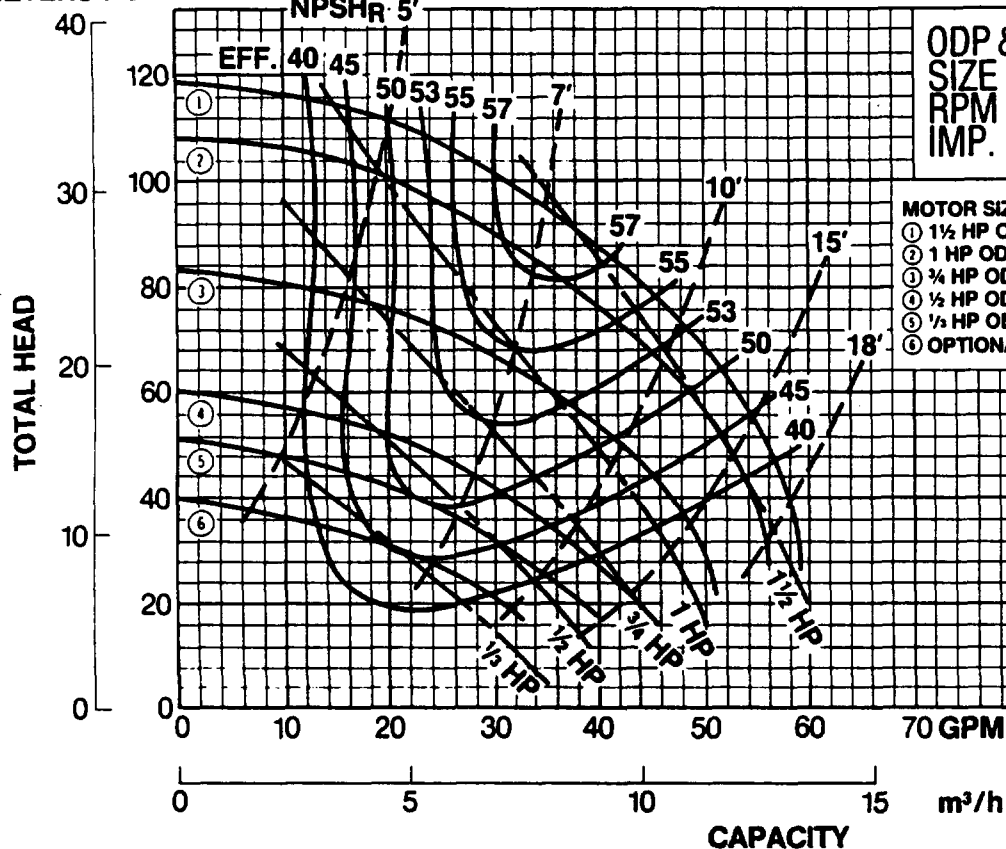
SECTION 1

MODEL

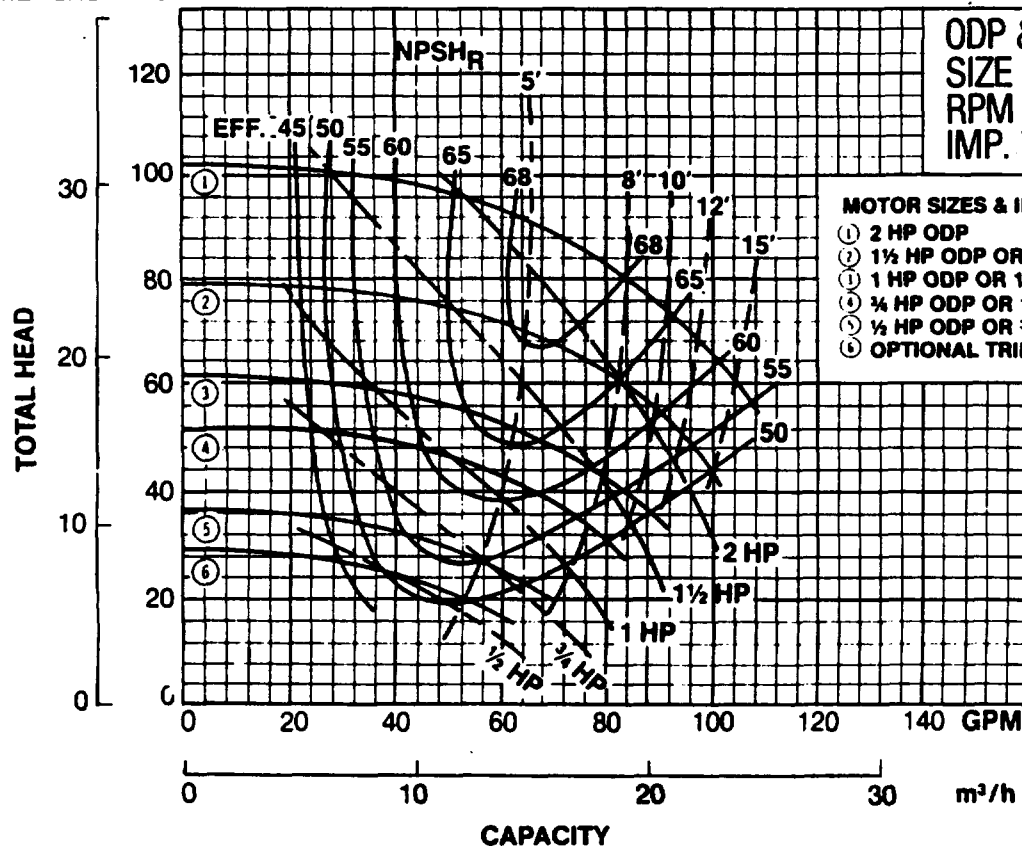
3642



METERS FEET



METERS FEET



EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO. SS2-C1

NAME EQUALIZATION/AERATION TANK
VAPOR PHASE CARBON ADSORBER

LOCATION TREATMENT BUILDING

MANUFACTURER ENCOTECH, Inc.
P.O. Box 838
Donora, PA 15033
412-379-4555

DISTRIBUTOR _____

DESCRIPTION 2000 lb. adsorber
100 cfm
4'OD, 7'OM
Carbon steel with epoxy interior coating and
epoxy exterior finish

MAINTENANCE Replace carbon when spent

COMPONENT PARTS _____

SPARE PARTS _____

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO. SS2-X1

NAME INCLINED PLATE SETTLER

LOCATION TREATMENT BUILDING

MANUFACTURER Parkson Corp.
2727 NW 62nd Street
Ft. Lauderdale, FL 33309
305-974-6610

DISTRIBUTOR Siewert Equipment
175 Akron Street
Rochester, NY 14609
716-482-9640

DESCRIPTION Lamella Gravity Plate Settler
Model 125155
125 sq. ft area
FRP plates, steel housing
13' L8" DAH. (6' x 4' floor space)

MAINTENANCE _____

COMPONENT PARTS _____

SPARE PARTS _____

INCLINED PLATE SETTLER

SETTLER SIZED TO HANDLE 42 GPM (50 GPM MAX)
WITH THE FOLLOWING PERFORMANCE:

<u>INFLUENT</u>	<u>EFFLUENT</u>
150 PPM Fe	60 PPM Fe
405 PPM Ca	243 PPM Ca
145 PPM Mg	116 PPM Mg
150 PPM TSS	< 10 PPM TSS
pH 8-10	
TEMP 50-70 F	

BASED ON OUR SPECIFICATIONS, THE MODEL
RECOMMENDED BY THE VENDOR IS THE
PARIKSON LAMELLA GRAVITY SETTLER
MODEL 125/55

LAMELLA[®] GRAVITY SETTLER

PACKAGED

LAMELLA[®] GRAVITY SETTLER

SPECIFICATION

CONSULTANT:	TREATEK
CUSTOMER:	UNDISCLOSED
APPLICATION:	GROUNDWATER REMEDIATION
DATE:	August 3, 1992

1.00 Scope

- 1.01 This specification covers a packaged Lamella® Gravity Settler, model 125/55, as manufactured by Parkson Corporation.

2.00 Design Details - Mechanical

- 2.01 The Lamella Gravity Settler shall provide 125 sq.ft. of total projected plate area. This area shall be divided to provide 100 sq.ft. of clarification area and 25 sq.ft. of inlet area. Calculations of all plate areas shall be submitted with the bid proposal.
- 2.02 Plates shall be a minimum of 0.09" thick FRP. Plates shall be 8 feet long by 2 feet wide. Continuous PVC I-Beam stiffeners shall run the full length of the plates, forming a minimum flow profile ratio of 8:1. The stiffeners shall be placed on a maximum 12" centers. Plates shall be manufactured in rigid plate pack assemblies held together with nylon clips.
- 2.03 The Lamella Gravity Settler tank shall be fabricated from ASTM A-36 steel. Minimum tank thickness shall be 3/16".
- 2.04 The Lamella Gravity Settler sludge hopper shall be fabricated from ASTM A-36 steel. Minimum hopper thickness shall be 3/16". The sludge hopper shall provide a minimum of 125 gallons of sludge storage.
- 2.05 The flash mix and flocculator tank combination shall be a minimum of 12" x 12" x 3' high and 2' x 2' x 3' high respectively.
- 2.06 The flocculator mixer shall be a variable slow-speed mixer comprised of a paddle-type mixer with a hollow shaft gear reducer, 1/3 hp. Electrical characteristics shall be 115V/ 1 phase/60 Hz. Motor enclosure to be TEFC or TENV.
- 2.07 The flash mixer shall be a fixed-speed, rapid mixer comprised of a propeller mixer with a hollow shaft gear reducer, 1/2 hp. Electrical characteristics are 115V/1 phase/60 Hz. Motor enclosures to be TEFC or TENV.
- 2.08 The unit shall be structurally designed for installation in Seismic Zone #1 in accordance with 1979 Uniform Building Code. Vendor to submit Seismic calculations upon request.

2.09 All structural and tank steel stresses to be within allowable limits as shown in the Steel Construction Manual of the American Institute of Steel Construction, latest edition.

3.00 Design Details - Process

3.01 The units shall be designed to settle out suspended solids from a 42 gpm groundwater feed stream containing approximately 500 ppm total suspended solids (after neutralization). Based on 100 sq.ft. of clarification area, the loading rate shall be 0.42 gpm/sq.ft.

3.02 Velocities through the unit shall be kept low to ensure full utilization of all plate area and to prevent the shearing of flocs. Flow velocity calculations shall be submitted with the proposal for the following:

- (1) feed ducts;
- (2) feed box;
- (3) Plate feed slots.

3.03 Submerged effluent throttling devices shall be provided to ensure a minimum pressure drop of 2-3 inches of water at design flow. Individual throttling devices shall be centered over each individual plate spacing to provide maximum plate utilization. Each bidder shall detail the method of flow control, and shall submit pressure drop calculations.

3.04 Maldistribution calculations based on showing the percentage change in pressure drop to allow for a unit leveling error of 1/8" and 1/4" shall be submitted.

3.05 Bidders shall submit projected polymer dosage rates and types of polymers required.

3.06 Bidders shall submit a complete process description detailing all process parameters.

4.00 Performance

4.01 Each bidder shall provide a written guarantee detailing overflow and underflow predictions. This guarantee shall be based on the basis of laboratory settling tests or on-site pilot tests or past operating experience. If the guarantee is based on past operating experience, documentation of that experience shall be submitted with the proposal. All lab test summaries shall also be submitted.

- 4.02 Each bidder shall submit with the bid a list of all U.S. installations. They should also submit a list of all U.S. installations operating on similar applications.

5.00 Installation

- 5.01 Each bidder shall submit general installation procedures with the proposal for the proposed unit along with an accurate time estimate for complete installation.

6.00 Welding & Surface Preparation

- 6.01 Weldments shall be designed and performed in general conformance with AWS design standards. Continuous welds shall be used for all seal or structural support welds and intermittent welding for stiffener welds.

6.02 Testing

A. All seal welds are to be visually and dye-penetrant tested.

B. All tankage is to be shop-hydrostatically tested.

6.03 Surface Preparation

For Lamella Gravity Settlers manufactured in carbon steel, all carbon steel surfaces shall be sandblasted in accordance with the Steel Structures Painting Council Surface Preparation ANSI SSPC SP-06 "Commercial blast Condition", latest edition, on all non-wetted surfaces and ANSI SSPC-SP10 "Near-white metal blast condition" for all wetted surfaces.

6.04 Paintings & Coatings

For Lamella Gravity Settlers manufactured in carbon steel, all carbon steel surfaces shall be painted as follows:

Exterior Surfaces:

- A. The base coat shall be DuPont High Solids Epoxy Mastic LF-63325P shale gray at a spread rate of 5-6 mils DFT.
- B. The finish coat shall be DuPont High Solids 50P Polyacryl Anhydride Enamel, Safety Blue at a spread rate of 1.5 - 2.5 mils DFT.
- C. Total DFT shall be 6.0 mils minimum average.
- D. Primer and paint shall be applied in accordance with coating manufacturer's recommendations.

Interior Surfaces:

- A. The base coat shall be DuPont High Solids Epoxy Mastic LF-63325P shale gray at a spread rate of 5-6 mils.
- B. The finish coat shall be DuPont Solids Epoxy Mastic LF-65M25P Safety Blue at a spread rate of 5-6 mils DFT.
- C. Total DFT shall be 10.0 mils minimum average.
- D. Primer and paint shall be applied in accordance with coating manufacturer's recommendations.

6.05 Stainless steels, nickel, monel, lead, Hastelloy, galvanized steel, rubber, plastic or fiberglass surfaces, drives, motors, etc., and fasteners shall not be painted.



EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-P11</u>
NAME	<u>INCLINED PLATE SETTLER SLUDGE PUMP</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>Wilden Pumps</u> <u>22069 Van Buren, P.O. Box 845</u> <u>Colton, CA 92324</u> <u>714-422-1730</u>
DISTRIBUTOR	<u>Glauber Equipment Corp.</u> <u>3940 Broadway</u> <u>Buffalo, NY 14223</u> <u>716-681-1234</u>
DESCRIPTION	<u>Model M-1 Air Operated Diaphragm Pump</u> <u>Polypropylene</u> <u>Flow of 10 gpm at 50' head</u> <u></u> <u></u>
MAINTENANCE	<u></u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u>Wet end repair kit</u> <u>Dry end repair kit</u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u>

SPECIFICATIONS AND PERFORMANCE



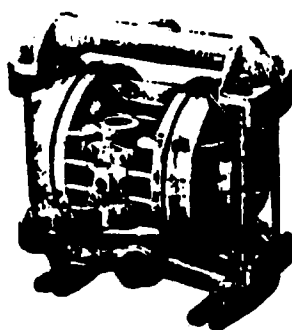
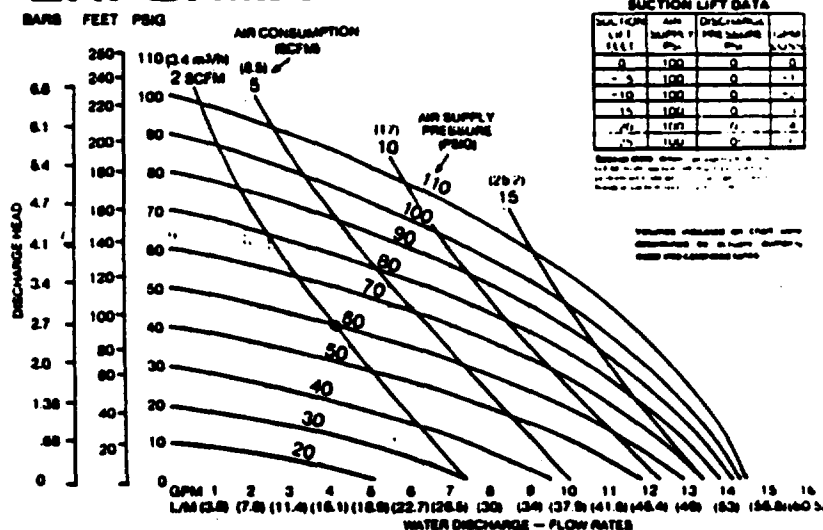
M-1
For Flows to 14 GPM

WILDEN® MODEL M1®

Height 8 1/2"
Width 8"
Depth 6 1/2"
Weight 8 lbs.
Air Inlet 1/2" Female N.P.T.
Inlet 1/2" Female N.P.T.
Outlet 1/2" Female N.P.T.
Suction Lift 15' Dry
25' Wet

Max. Size Solids 1/4" Dia.
Example: To pump 4 gpm against a discharge pressure of 40 psig requires 60 psig and 2 scfm air consumption. (See dot on chart.)

Caution: Do not exceed 100 psig air supply pressure.



M-2
For Flows to 37 GPM

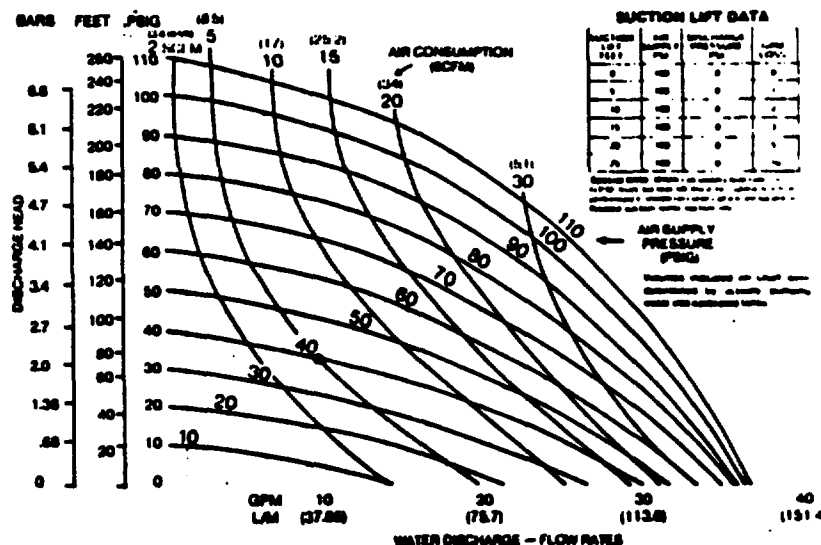
WILDEN® MODEL M2®

Height 10 1/2"
Width 10 1/2"
Depth 7"
Weight 22 lbs.
Air Inlet 1/2" N.P.T.
Inlet 1" Male N.P.T.
Outlet 1/2" Male N.P.T.
Suction Lift 18' Dry
25' Wet

Max. Size Solids 1/2" Dia.
Example: To pump 10 gpm against a discharge pressure of 35 psig requires 40 psig and 5 scfm air consumption. (See dot on chart.)

Note: For M2 pumps fitted with Teflon diaphragms reduce water discharge figures by 20%. Suction lift for M2 pumps with Teflon diaphragms: 10 ft dry, 25 ft wet.

Caution: Do not exceed 125 psig air supply pressure.



M-4
For Flows to 73 GPM

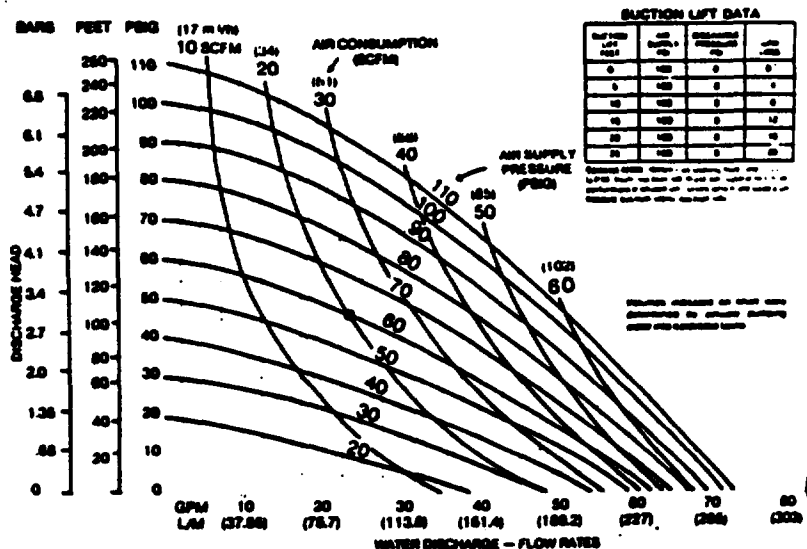
WILDEN® MODEL M4®

Height 18"
Width 14 1/2"
Depth 11 1/2"
Weight 35 lbs.
Air Inlet 1/2" N.P.T.
Inlet 1 1/2" Female N.P.T.
Outlet 1 1/2" Male N.P.T.
Suction Lift 22' Dry
27' Wet

Max. Size Solids 3/4" Dia.
Example: To pump 22.5 gpm against a discharge pressure head of 45 psig, requires 60 psig and 20 scfm air consumption. (See dot on chart.)

Note: For M4 pumps fitted with Teflon diaphragms reduce water discharge figures by 20%. Suction lift for M4 pumps with Teflon diaphragms: 12 ft dry, 25 ft wet.

Caution: Do not exceed 125 psig air supply pressure.



EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO. SS2-T3

NAME ACID STORAGE TANK

LOCATION TREATMENT BUILDING

MANUFACTURER Plas-Tanks Industries, Inc.
5011 Factory Drive
Fairfield, OH 45014
513-829-8888

DISTRIBUTOR K-Tech Assoc.
1868 Niagara Falls Blvd., Suite 304
Niagara Falls, NY 14150
716-695-1038

DESCRIPTION FRP-Vinyl Ester with double nexus veil
3000 gallon capacity
flat bottom dished top
76"OD, 10'SSH

MAINTENANCE Inspect for leaks

COMPONENT PARTS

SPARE PARTS

ACID TANK

SYSTEM REQUIRES APPROXIMATELY 2.375 gal/hr
OF 32% HCl TO NEUTRALIZE pH IN STREAM
FROM pH OF 10 (SEE MASS BALANCE CALCULATIONS)

$$2.375 \frac{\text{gal}}{\text{hr}} \times 24 \frac{\text{hr}}{\text{day}} = 57 \text{ gal/day}$$

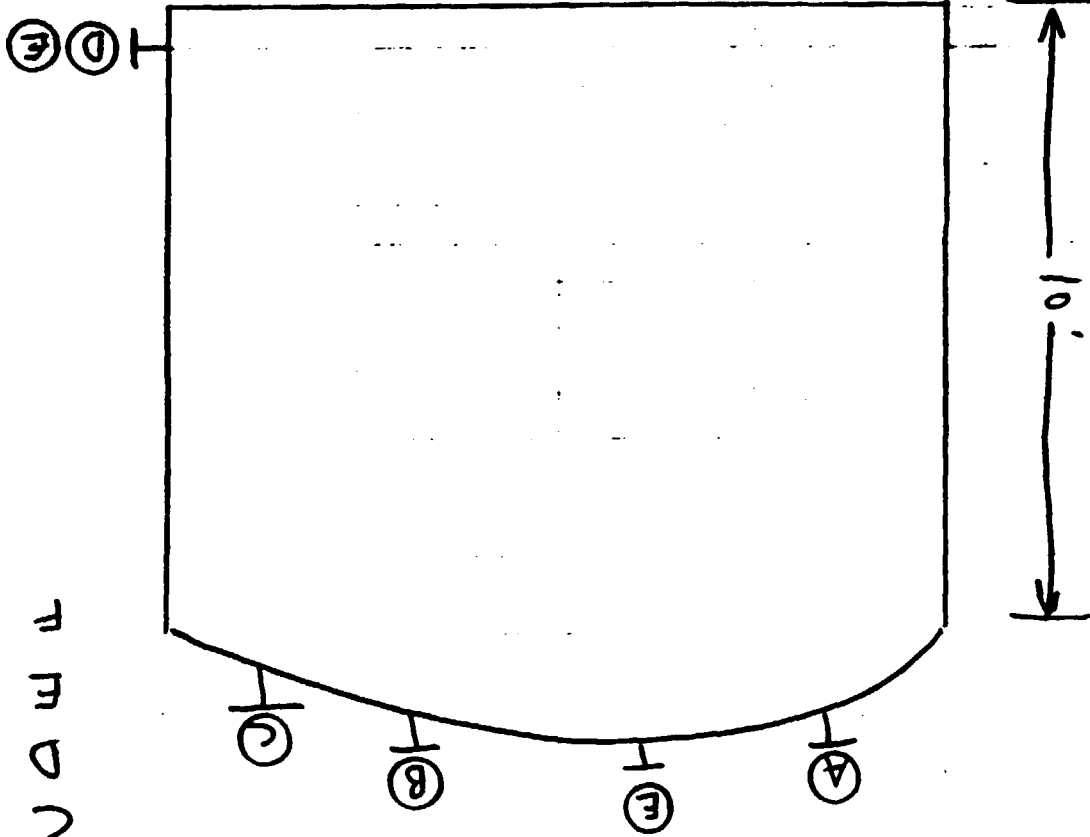
3300 GAL TANK (CONSISTENT SIZE WITH CAUSTIC
TANK) TO GIVE APPROXIMATELY 52 DAYS
STORAGE, USING A 3000 GAL OPERATING VOLUME

FRP TANK

7.5 ft dia x 10 ft SSH

ACID STORAGE
3000 gal

DESCRIPTION	SIZE	A
INLET	3"	B
LEVEL INST.	2"	C
MANWAY	18"	D
PUMP SUCTION	2"	E
DRAIN	2"	F
VENT	3"	



WEIGHT EMPTY

WEIGHT FULL

PRELIMINARY FOR
DESIGN PACKAGE



22-141 50 SHEETS
22-142 100 SHEETS
22-144 200 SHEETS

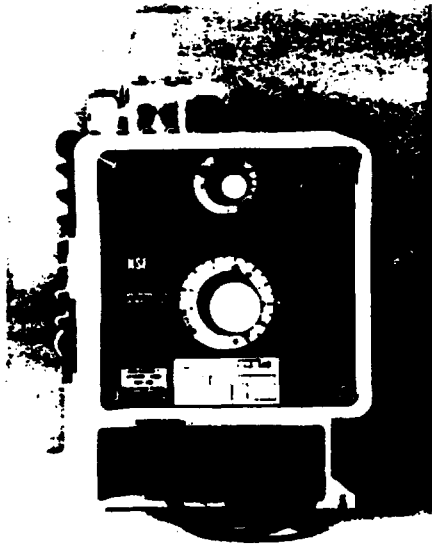
EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-P4</u>
NAME	<u>ACID METERING PUMP</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>LMI</u> <u>19 Craig Road</u> <u>Acton, MA 01720-5495</u> <u>508-263-9800</u>
DISTRIBUTOR	<u>Stranco</u> <u>595 Industrial Drive</u> <u>P.O. Box 389, Bradley, IL 60915-0389</u> <u>815-932-8156</u>
DESCRIPTION	<u>Model D741 (6-20 GPM)</u> <u>365 wet end (TFE)</u> <u>30691 analog to digital converter</u> <u> </u> <u> </u>
MAINTENANCE	<u> </u> <u> </u> <u> </u> <u> </u>
COMPONENT PARTS	<u> </u> <u> </u> <u> </u> <u> </u> <u> </u>
SPARE PARTS	<u> </u> <u> </u> <u> </u> <u> </u> <u> </u>

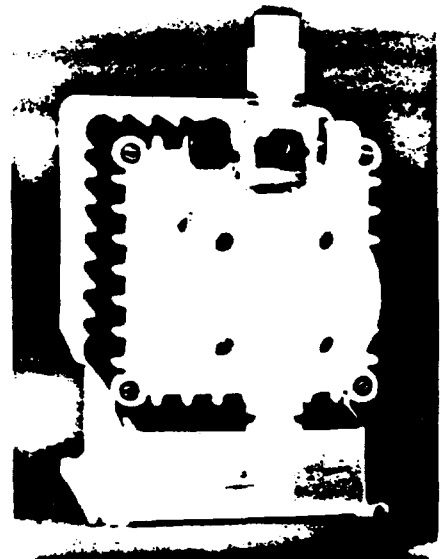
SERIES B and D

ELECTROMAGNETIC METERING PUMPS



■ LMI'S ACCURATE,
DEPENDABLE SERIES B
METERING PUMP—
CONTROL PANEL VIEW

■ LMI'S TOTALLY ENCLOSED,
CORROSION RESISTANT
SERIES D METERING PUMP—
PUMP HEAD VIEW



LMI
LIQUID METRONICS DIVISION
MILTON ROY

2. OUTPUT SPECIFICATIONS

SERIES	GALLONS PER HOUR		LITERS PER HOUR		mL OR CC PER MIN.		OUTPUT PER STROKE		MAX INJECTION PRESSURE
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
B11, B71	.008	1.6	.03	6	0.5	100	1.0	1.0	150 PSI (10.3 Bar)
BE2, B12, B72	.012	2.5	.05	9.5	.79	158	.16	1.58	100 PSI (6.9 Bar)
BE3, B13, B73	.022	4.5	.085	17.0	1.42	284	.28	2.84	50 PSI (3.4 Bar)
B14, B74, BE7	.04	7.0	.13	26.5	2.21	442	.44	4.42	30 PSI (2.07 Bar)
B41*	0.	1.6	0.	6.0	0.	100	.1	1.0	150 PSI (10.3 Bar)
B42*	0.	2.5	0.	9.5	0.	158	.16	1.58	100 PSI (6.9 Bar)
B43*	0.	4.5	0.	17.0	0.	284	.28	2.84	50 PSI (3.4 Bar)
B44*	0.	7.0	0.	26.5	0.	442	.44	4.42	30 PSI (2.07 Bar)
D11, D71	.012	2.5	.05	9.5	.79	158	.21	2.10	150 PSI (10.3 Bar)
DE2, D12, D72	.02	4.0	.76	15.2	1.28	252	.34	3.36	100 PSI (6.9 Bar)
DE3, D13, D73	.04	8.0	.15	30.3	2.51	505	.67	6.73	60 PSI (3.4 Bar)
DE4, D14, D74	.1	20.0	.38	76.0	6.3	1260	1.68	16.8	20 PSI (2.07 Bar)
D41*	0.	2.5	0.	9.5	0.	158	.1	1.02	150 PSI (10.3 Bar)
D42*	0.	4.0	0.	15.2	0.	253	.32	3.16	100 PSI (6.9 Bar)
D43*	0.	8.0	0.	30.3	0.	504	.63	6.3	60 PSI (3.5 Bar)
D44*	0.	20.0	0.	76.0	0.	1262	1.6	15.8	20 PSI (2.07)

*Series B4 and D4 pumps operate from a 4-20 mA signal source. Incoming signal automatically controls pump output from zero to maximum.

3. VOLTAGE CODES

The final digit of each drive assembly number designates both voltage and power cord/plug type. When ordering please indicate desired voltage by inserting one of the following digits in this position.

- | | |
|-----------------------------|--------------------------------------|
| [1] 115 VAC | [5] 240 - 250 VAC, British (UK) Plug |
| [2] 230 VAC | [6] 240 - 250 VAC, Aust./N.Z. Plug |
| [3] 220 - 240 VAC, DIN Plug | [7] 220 VAC, Swiss Plug |

You should now have a complete Drive Assembly part number, such as B721, where B7 indicates the control option you chose in step 1, 2 indicates the output range you require from step 2, and 1 indicates the voltage code you require from step 3.

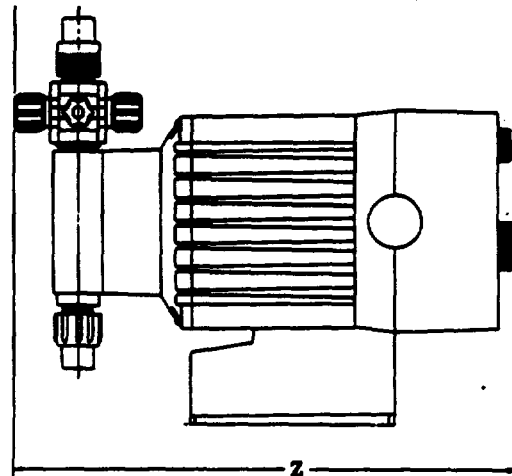
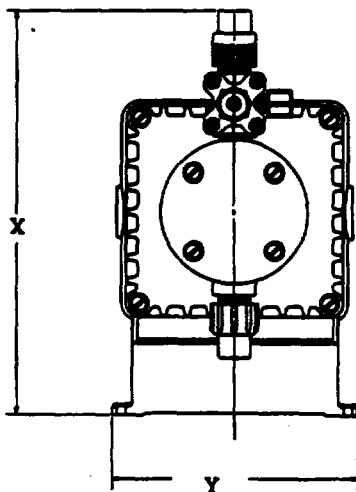
ADDITIONAL SPECIFICATIONS

SERIES	PEAK INPUT POWER (WATTS)	AVERAGE INPUT POWER (WATTS @ MAX SPEED)	STROKE LENGTH ADJUSTABLE (0-100%) RECOMMENDED MIN.	STROKE FREQUENCY ADJUSTABLE (STROKES PER MINUTE)
B11, B71	248	29	15%	5 TO 100
B12, B13, B14	248	29	10%	5 TO 100
B41, B42, B43, B44	248	29	10%	0 TO 100
B72, B73, B74	248	29	10%	5 TO 100
D10, D11, D12, D13, D14	381	33	10%	3.75 TO 75
D40, D41, D42, D43, D44	381	33	10%	0 TO 75
D70, D71, D72, D73, D74	381	33	10%	3.75 TO 75

VOLTAGE: 115 VAC, 50/60 Hz, SINGLE PHASE
230-250 VAC, 50/60 Hz, SINGLE PHASE

DIMENSIONS

SERIES	LENGTH (Z) Inches (mm) MAX	WIDTH (Y) Inches (mm) MAX	HEIGHT (X) Inches (mm) MAX	SHIPPING WEIGHT LBS (Kg)
B1, B7	10.5 (267)	5.72 (146)	8 (203)	15 (6.9)
B4	10.75 (273)	5.72 (146)	8 (203)	15 (6.9)
D1, D7	11.625 (296)	5.72 (146)	9.25 (235)	19 (8.7)
D41, D42	10.75 (273)	5.72 (146)	9.25 (235)	19 (8.7)
D43	11.0 (280)	5.72 (146)	9.25 (235)	19 (8.7)
D44	11.70 (298)	5.72 (146)	9.25 (235)	19 (8.7)



EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-T4</u>
NAME	<u>SURGE TANK #1</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>Plas-Tanks Industries, Inc.</u> <u>5011 Factory Drive</u> <u>Fairfield, OH 45014</u> <u>513-829-8888</u>
DISTRIBUTOR	<u>K-Tech Assoc.</u> <u>1868 Niagara Falls Blvd., Suite 304</u> <u>Niagara Falls, NY 14150</u> <u>716-695-1038</u>
DESCRIPTION	<u>FRP-Vinyl Ester with single nexus veil</u> <u>Flat Bottom, Dished Top</u> <u>2000 gallon capacity</u> <u>6'OD, 10'SSH</u>
MAINTENANCE	<u>Inspect for leaks</u>
COMPONENT PARTS	
SPARE PARTS	

SURGE TANK #1

TANK TO PROVIDE ~2000 GAL VOLUME OF
WATER FOR PUMPING INTO BIOTOWER

FRP TANK

6 ft dia x 10 ft SSH

$$\pi \left(\frac{6\text{ft}}{2} \right)^2 (10\text{ft}) \left(\frac{7.48\text{gal}}{\text{ft}^3} \right) = 2150\text{gal}$$

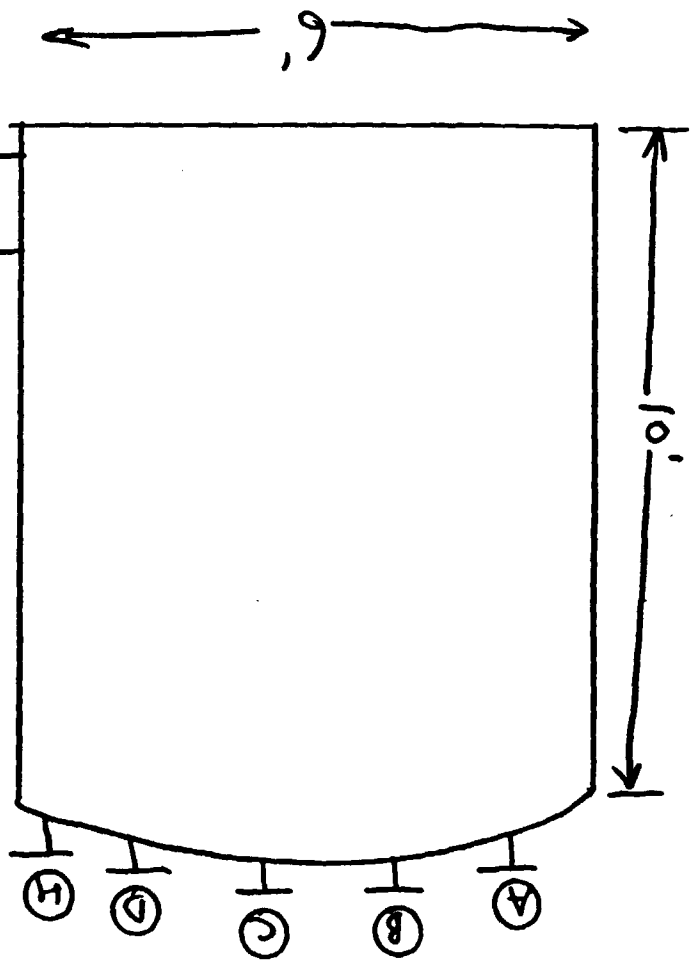
USING 1500 GAL OPERATING VOLUME AT
50 GPM FLOW

$$\frac{1500\text{ GAL}}{50\text{ gpm}} = 30\text{ MIN RETENTION TIME}$$

AT FULL VOLUME



WEIGHT EARTH _____
WEIGHT FULL _____



DESCRIPTION	SIZE	
ACID INLET	2"	A
INLET	3"	B
LEVEL INST	3"	C
SPACE	18"	D
MANWAY	3"	E
PUMP SUCTON	2"	F
DRAIN	2"	G
PUMP RECYLE	2"	H

2000 gal
SURGE TANK #1

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO. SS2-X2

NAME BIOTOWER

LOCATION TREATMENT BUILDING

MANUFACTURER US Filter Corp
Lancy Environmental Systems, Inc.
181 Thorn Hill Road
Warrendale, PA 15086
412-772-0044

DISTRIBUTOR _____

DESCRIPTION Upflow, fixed film, media filled
Epoxy coated steel
20,300 gallon capacity
12'ID, 24'M

MAINTENANCE Inspect for leaks

COMPONENT PARTS _____

SPARE PARTS _____

BIOTOWER

VESSEL REQUIRES 6 HR RETENTION
TIME FOR BIO ACTIVITY TO BREAK DOWN
CONTAMINANTS

STEEL TANK WITH PVC PACKING
12 ft dia x 24 ft SSH

$$\pi \left(\frac{12 \text{ ft}}{2} \right)^2 (24 \text{ ft}) \left(\frac{7.48 \text{ gal}}{\text{ft}^3} \right) = 20,300 \text{ VOLUME}$$

18,190 OPERATING VOLUME

$$\frac{18,190 \text{ gal}}{50 \text{ gpm}} = 363.8 \text{ min} \approx 6 \text{ hr}$$

Bio Tower - per Larry/US Filter package

Reactor - 12' ϕ x 24' H

agitated steel
6 hr continuous
18,190 gal open vol

Influent Pump - Duro Mark III

1K1.5 x 1 - 6 2RV
50 gpm at 50' TDH

230-460V/3 ϕ /3HP/3600rpm

Kut Addition Trs - 2' - 6" ϕ x 3' H 110 gal FRP

Blower - 15hp/460V

Inoculum Tr - 3' 6" ϕ x 3' - 6" H, 250 gal FRP

Sedg Pump - Wilden M-2

chemicum
air oper, diaphragm

Kut addn pump - air oper at LMI

Imoc addn pump - air oper at LMI

Kut mixer - Chemura LTD-2

1/4HP 1800rpm 115/230V, 1 ϕ

LANCY ENVIRONMENTAL SYSTEMS, INC.

Item No.

Description

AEROBIC BIO-TOWER

This aerobic reactor receives pretreated leachate from the ECONO-TREAT reactor. It is designed and cultured for the abatement of organic constituents found in the groundwater.

Manufacturer	U.S. Filter, Inc.
Overall Size	12'-0" Dia. x 24' H
Total Volume	20,300 Gallons
Freeboard	3'-6"
Operating Volume	18,190 Gallons
Material	3/16" Carbon Steel Side Wall; 1/4" Flat Carbon Steel Bottom
Coatings:	
• Immersion	Coal Tar Epoxy
• Non-Immersion	High Solids Epoxy
Influent Nozzle	4", 150# Flange
Internal Influent Distrib. ...	304 SS Manifold w/Dual Headers
Air Inlet Nozzle	2-1/2", 150# Flange
Internal Air Distributor	304 SS Header w/Laterals
Media	113 Ft ³ Munters PVC Media 1580 Ft ³ Random Mass Transfer Polypropylene Packing
Effluent Nozzles	Three (3) 4", 150# Flange @ 1/2", 3/4" and Maximum Tank Height
Overflow Nozzle	4", 150# Flange
Recycle/Drain Nozzle	4", 150#, Flange
Cover	1/4" 10° Sloped Steel Roof
Vent Nozzle	6", 150# Flange (Tank Sidewall)
Sample Port	Two (2) 1" Couplings
Temperature Port	1" Coupling (Plugged)
Manway	Two (2) 24" (Tank Sidewall and Tank Roof)
Dry Weight	18,400 Lbs.
Operating Weight	196,400 Lbs.
Floor Loading	12.1 PSI
Seismic	Zone 3
Accessories:	
• Ladder w/Step-Off Plat	Carbon Steel
• Blowers	Two (2) Rotary Lobe 200 CFM @ 12 PSI 15 HP, 1750 RPM,
• Recirc./Purge Pump ..	Horizontal Centrifugal 340 GPM @ 40' TDH

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-P3</u>
NAME	<u>BIOTOWER FEED PUMP</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>The Duriron Company, Inc.</u> <u>Pump Division</u> <u>Dayton, OH 45401</u> <u>513-226-4000</u>
DISTRIBUTOR	<u>US Filter Corp.</u> <u>Lancy Environmental Systems</u> <u>181 Thornhill Road</u> <u>Warrendale, PA 15086</u> <u>412-772-0044</u>
DESCRIPTION	<u>Mark III, 1K 1.5 x 1-6 2RV</u> <u>3HP, 230/460V, 3Ø, 3600 RPM</u> <u>50 GPM at 50' head</u> <u> </u> <u> </u>
MAINTENANCE	<u>Inspect for leaks</u> <u>Grease monthly</u> <u> </u> <u> </u> <u> </u>
COMPONENT PARTS	<u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u>
SPARE PARTS	<u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u>

U. S. FILTER, INC.
Warrendale, PA

Item No.

Description

LIFT STATION TANK

Solution	Wastewater
Volume (Capacity)	210 Gallon
Size	3'-6"ø x 3' High
Type	Flat Bottom/Cylindrical
Construction	FRP
Inner Corrosion Barrier	Atlac 382 or Equal
Cover	None
Inlet Nozzle	None
Pumpout Nozzle	3"ø Flanged
Level Control Nozzle	None
Vent	None
Tie Down Lugs	3 @ 120°
Lifting Lugs	None
Other	None

DUPLEX CENTRIFUGAL PUMP - INFLUENT TO BISTOWER

Manufacturer	Durco Mark III
Model No	1K1.5 x 1-62RV
Service	Wastewater
Capacity	50 GPM
Head	50' TDH
Motor	3 HP/230-460V/3ø/60 Hz/3600 RPM
Type	Horizontal Centrifugal
Wetted Materials	Cast Iron
Inlet	1.5" Flanged
Outlet	1" Flanged
Mechanical Seal	Single

DUPLEX PUMP LEVEL CONTROL

Manufacturer	Warrick
No. of Probes	Five (5)
Type	Wire Suspended Conductivity
Probe Material	PVC/Carpenter 20
Mounting	Condulet Style Probe Holder

Functional Control:

- | | | |
|---|-------|-----------------------------------|
| • | LE- A | High Level Alarm (6") |
| • | LE- B | High, High Secondary Pump On (9") |
| • | LE- C | High, Primary Pump On (18") |
| • | LE- D | Low, Pumps Off (40") |
| • | LE- E | Ground Reference (40") |

The probe location listed above are measured from the tank rim.

EQUIPMENT SPECIFICATION FORM

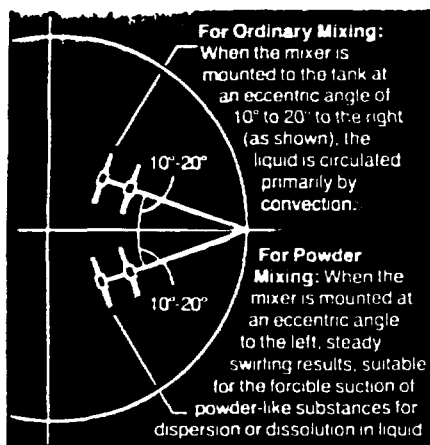
SUMMIT NATIONAL SITE

EQUIPMENT NO.	SS2-T5 and SS2-M1 SS2-T6 and SS2-M2
NAME	NUTRIENT ADDITION TANKS AND MIXERS
LOCATION	TREATMENT BUILDING
MANUFACTURER	Chemineer, Inc. US Filter Corp. P.O. Box 1123 Lancy Environmental Dayton, OH 45401 181 Thornhill Road 513-454-3200 Warrendale, PA 15086 412-772-0044
DISTRIBUTOR	Shrier Process Equipment P.O. Box 368, 1355 Pittsford - Mendon Road Mendon, NY 14506 716-624-4490
DESCRIPTION	FRP-3.5' OD x 3.5' H - ATLAL 382 Resin 250 Gallon capacity, Open Top Chemineer Model LTD-2 Mixer 1/4 HP, 115/230 V, 1Ø, 7800 RPM
MAINTENANCE	Inspect for leaks
COMPONENT PARTS	
SPARE PARTS	

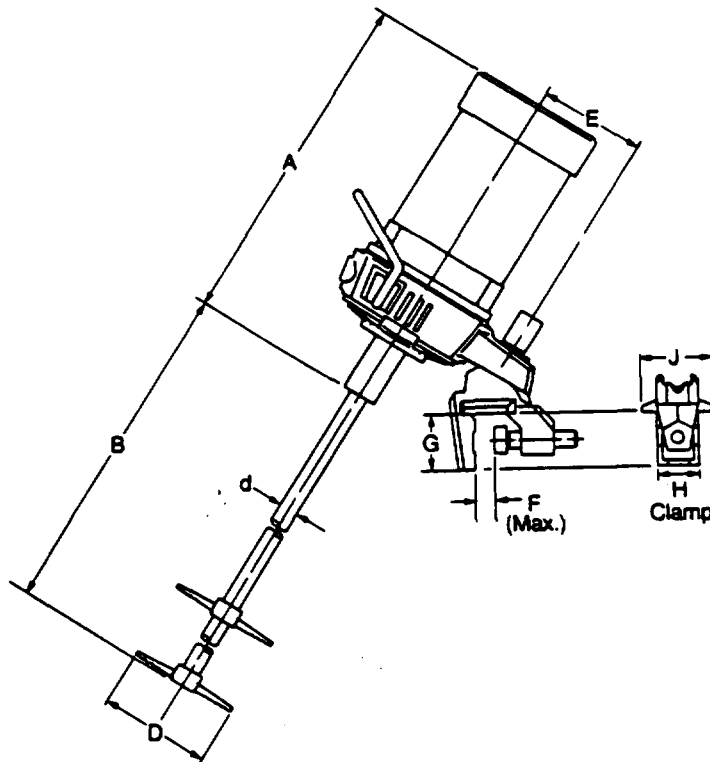
Chemineer

LTD Portable Mixer Proper Mounting Position

Chemineer Portable Mixers are designed to operate in the right-hand quadrants of the tank. Determine your specific application, and use the following positions for optimal mixer placement.



Standard
Eccentric Angle
For Mounting



LTD (Direct Drive) Portable Mixer Specifications

Model	Motor				Shaft		Impeller		Weight
	HP	Frame	RPM	Ph-Voltage	Dia.	Length	Dia.	Qty.	
LTD-2	1/4	56C	1800	1-115/230	16 mm .63 in	950 mm 37.40 in	110 mm 4.33 in	2	15.8 kg 34.9 lbs
LTD-5	1/2	56C	1800	1-115/230	20 mm .79 in	1190 mm 46.85 in	120 mm 4.72 in	2	20.4 kg 45.0 lbs
LTD-10	1	143TC	1800	3-208/230/480	25 mm .98 in	1425 mm 56.10 in	140 mm 5.51 in	2	31.5 kg 69.5 lbs
LTD-20	2	145TC	1800	3-208/230/480	25 mm .98 in	1625 mm 64.0 in	140 mm 5.51 in	2	37.0 kg 81.5 lbs

The weights listed above are for fully-assembled units.

Explosion-proof motors are suitable for Class 1, Group D and Class 2, Groups F & G.

LTD Standard Dimensions

Model		A*	B	d	D	E	F (Max.)	G	H	J
LTD-2	mm	391	950	16	110	120	39	65	55	95
	inches	15.39	37.40	0.63	4.33	4.72	1.54	2.56	2.17	3.74
LTD-5	mm	407	1190	20	120	120	39	65	55	95
	inches	16.02	46.85	0.79	4.72	4.72	1.54	2.56	2.17	3.74

*Dimension A shown in the table above may vary depending on the motor used.

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-T7</u>
NAME	<u>INOCULUM ADDITION TANK</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>US Filter</u> <u>Lancy Environmental</u> <u>181 Thornhill Road, Warrendale, PA 15086</u> <u>412-772-0044</u>
DISTRIBUTOR	<u></u> <u></u> <u></u> <u></u>
DESCRIPTION	<u>FRP Tank 3'-6"OD, 3'-6"H</u> <u>250 gallon capacity, open top</u> <u>Atlac 382 resin</u> <u></u> <u></u>
MAINTENANCE	<u>Inspect for leaks</u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>

No. Description**INOCULUM SUPPLY TANK**

This bioseeder is a make-up tank for selected cultures that are batch fed to the Aerobic Bio-Tower.

Manufacturer	Lancy Environmental Systems, Inc.
Solution	Aerated Inoculum Mixture
Size	3'-6" Dia. x 3'-6" High
Total Volume	250 Gallons
Freeboard	0'-6"
Operating Volume	215 Gallons
Construction	FRP
Inner Corrosion Barrier	Atlac 382 or Equal
Cover	None
Exhaust Collar	None
Overflow Nozzle	None
Drain Nozzle	None
Tie-Down Lugs	3 @ 120°
Dry Weight	190 Lbs.
Operating Weight (Max.)	2,290 Lbs.
Floor Loading	1.65 PSI
Accessories:	
• PVC Air Sparger	
• Air Operated Diaphragm Pump, Manual Air Station and Pump Mounting Bracket	
Detail Drawing	T1, Sheets 1 and 2

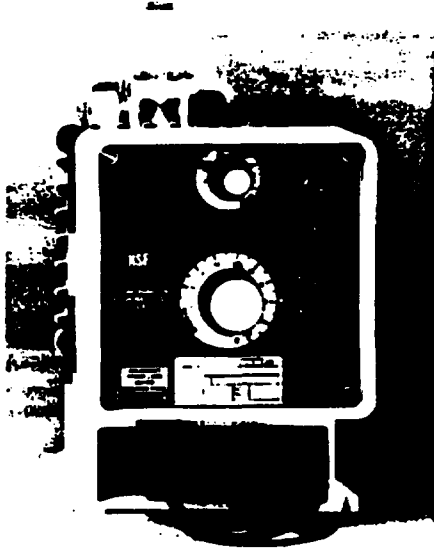
EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-P6 and SS2-P7</u>
NAME	<u>Nutrient Addition Metering Pumps</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>LMI</u> <u>19 Craig Road</u> <u>Acton MA 01720-5495</u> <u>508-263-9800</u>
DISTRIBUTOR	<u>Stranco</u> <u>595 Industrial Drive, P.O. Box 389</u> <u>Bradley, IL 60915-0389</u> <u>815-932-8154</u>
DESCRIPTION	<u>Model D741 Drive</u> <u>365 Wet End</u> <u>30691 Analog to Digital Converter</u> <u>115 V</u>
MAINTENANCE	<u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u>

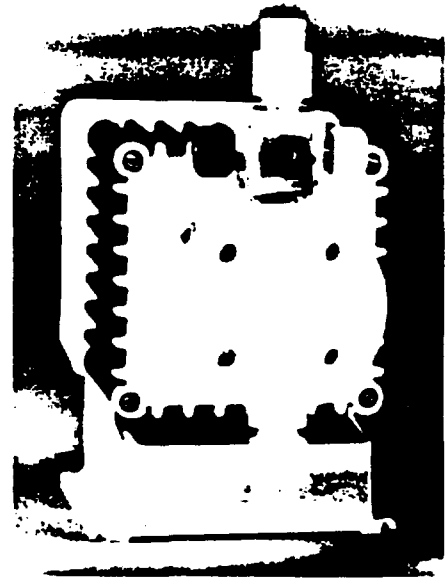
SERIES B and D

ELECTROMAGNETIC METERING PUMPS



■ LMI'S ACCURATE,
DEPENDABLE SERIES B
METERING PUMP—
CONTROL PANEL VIEW

■ LMI'S TOTALLY ENCLOSED,
CORROSION RESISTANT
SERIES D METERING PUMP—
PUMP HEAD VIEW



LMI
LIQUID METRONICS DIVISION
MILTON ROY

2. OUTPUT SPECIFICATIONS

SERIES	GALLONS PER HOUR		LITERS PER HOUR		mL OR CC PER MIN.		OUTPUT PER STROKE		MAX INJECTION PRESSURE
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
B11, B71	.008	1.6	.03	6	0.5	100	1.0	1.0	150 PSI (10.3 Bar)
BE2, B12, B72	.012	2.5	.05	9.5	.79	158	.16	1.58	100 PSI (6.9 Bar)
BE3, B13, B73	.022	4.5	.085	17.0	1.42	284	.28	2.84	50 PSI (3.4 Bar)
B14, B74, BE7	.04	7.0	.13	26.5	2.21	442	.44	4.42	30 PSI (2.07 Bar)
B41*	0.	1.6	0.	6.0	0.	100	.1	1.0	150 PSI (10.3 Bar)
B42*	0.	2.5	0.	9.5	0.	158	.16	1.58	100 PSI (6.9 Bar)
B43*	0.	4.5	0.	17.0	0.	284	.28	2.84	50 PSI (3.4 Bar)
B44*	0.	7.0	0.	26.5	0.	442	.44	4.42	30 PSI (2.07 Bar)
D11, D71	.012	2.5	.05	9.5	.79	158	.21	2.10	150 PSI (10.3 Bar)
DE2, D12, D72	.02	4.0	.76	15.2	1.28	252	.34	3.36	100 PSI (6.9 Bar)
DE3, D13, D73	.04	8.0	.15	30.3	2.51	505	.67	6.73	60 PSI (3.4 Bar)
DE4, D14, D74	.1	20.0	.38	76.0	6.3	1260	1.68	16.8	20 PSI (2.07 Bar)
D41*	0.	2.5	0.	9.5	0.	158	.1	1.02	150 PSI (10.3 Bar)
D42*	0.	4.0	0.	15.2	0.	253	.32	3.16	100 PSI (6.9 Bar)
D43*	0.	8.0	0.	30.3	0.	504	.63	6.3	60 PSI (3.5 Bar)
D44*	0.	20.0	0.	76.0	0.	1262	1.6	15.8	20 PSI (2.07)

*Series B4 and D4 pumps operate from a 4-20 mA signal source. Incoming signal automatically controls pump output from zero to maximum.

3. VOLTAGE CODES

The final digit of each drive assembly number designates both voltage and power cord/plug type. When ordering please indicate desired voltage by inserting one of the following digits in this position.

- | | |
|-----------------------------|--------------------------------------|
| [1] 115 VAC | [5] 240 - 250 VAC, British (UK) Plug |
| [2] 230 VAC | [6] 240 - 250 VAC, Aust./N.Z. Plug |
| [3] 220 - 240 VAC, DIN Plug | [7] 220 VAC, Swiss Plug |

You should now have a complete Drive Assembly part number, such as B721, where B7 indicates the control option you chose in step 1, 2 indicates the output range you require from step 2, and 1 indicates the voltage code you require from step 3.

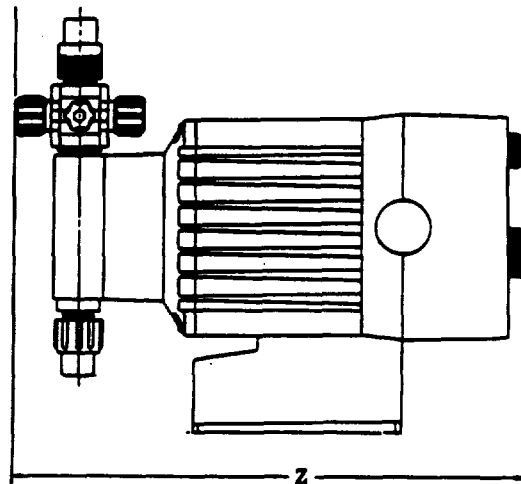
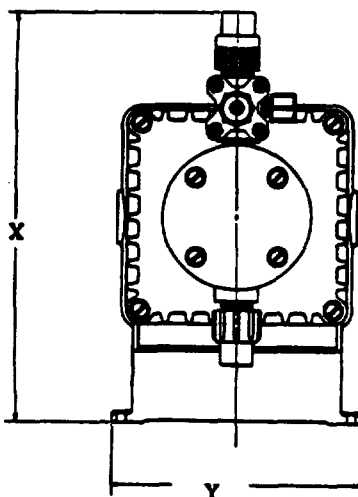
ADDITIONAL SPECIFICATIONS

SERIES	PEAK INPUT POWER (WATTS)	AVERAGE INPUT POWER (WATTS @ MAX SPEED)	STROKE LENGTH ADJUSTABLE (0-100%) RECOMMENDED MIN.	STROKE FREQUENCY ADJUSTABLE (STROKES PER MINUTE)
B11, B71	248	29	15%	5 TO 100
B12, B13, B14	248	29	10%	5 TO 100
B41, B42, B43, B44	248	29	10%	0 TO 100
B72, B73, B74	248	29	10%	5 TO 100
D10, D11, D12, D13, D14	381	33	10%	3.75 TO 75
D40, D41, D42, D43, D44	381	33	10%	0 TO 75
D70, D71, D72, D73, D74	381	33	10%	3.75 TO 75

VOLTAGE: 115 VAC, 50/60 Hz, SINGLE PHASE
230-250 VAC, 50/60 Hz, SINGLE PHASE

DIMENSIONS

SERIES	LENGTH (Z) Inches (mm) MAX	WIDTH (Y) Inches (mm) MAX	HEIGHT (X) Inches (mm) MAX	SHIPPING WEIGHT LBS (Kg)
B1, B7	10.5 (267)	5.72 (146)	8 (203)	15 (6.9)
B4	10.75 (273)	5.72 (146)	8 (203)	15 (6.9)
D1, D7	11.625 (296)	5.72 (146)	9.25 (235)	19 (8.7)
D41, D42	10.75 (273)	5.72 (146)	9.25 (235)	19 (8.7)
D43	11.0 (280)	5.72 (146)	9.25 (235)	19 (8.7)
D44	11.70 (298)	5.72 (146)	9.25 (235)	19 (8.7)



EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-P5</u>
NAME	<u>INOCULUM ADDITION METERING PUMP</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>Wilden Pumps</u> <u>22069 Van Buren, P.O. Box 845</u> <u>Colton, CA 92324</u> <u>714-422-1730</u>
DISTRIBUTOR	<u>Glauber Equipment Corp.</u> <u>3940 Broadway</u> <u>Buffalo, NY 14223</u> <u>716-681-1234</u>
DESCRIPTION	<u>Model M-1 Air Operated Diaphragm Pump</u> <u>Polypropylene</u> <u>Flow of 10 gpm at 50' head</u> <u> </u> <u> </u>
MAINTENANCE	<u> </u> <u> </u> <u> </u> <u> </u>
COMPONENT PARTS	<u>Wet end repair kit</u> <u>Dry end repair kit</u> <u> </u> <u> </u> <u> </u>
SPARE PARTS	<u> </u> <u> </u> <u> </u> <u> </u>

SPECIFICATIONS AND PERFORMANCE



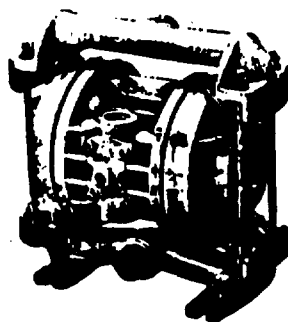
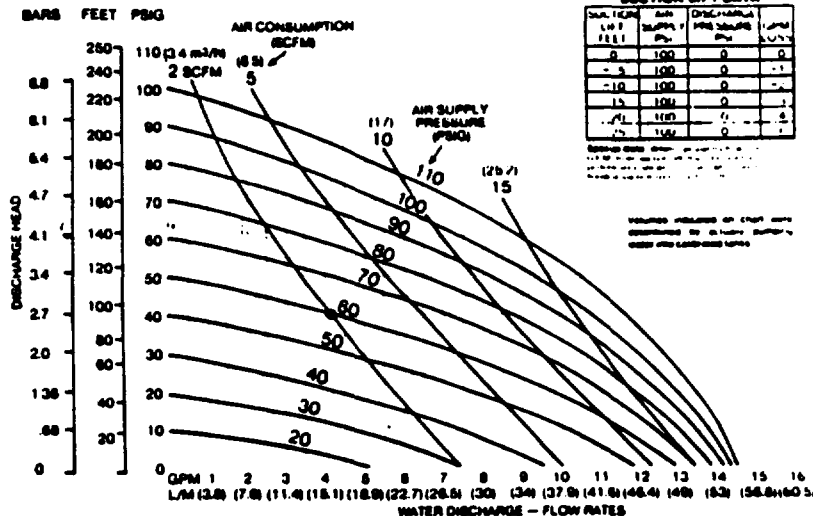
WILDEN® MODEL M1®

Height 8 1/2"
Width 8"
Depth 6 1/2"
Weight 14.5 lbs. ALUMINUM
Air Inlet 1/2" Female N.P.T.
Inlet 1/2" Female N.P.T.
Outlet 1/2" Female N.P.T.
Suction Lift 15' Dry
25' Wet

Max. Size Solids 1/4" Dia.
Example: To pump 4 gpm
against a discharge pressure of
40 psig requires 60 psig and 2
scfm air consumption. (See dot
on chart.)

Caution: Do not exceed 100
psig air supply pressure.

M-1
For Flows to 14 GPM



WILDEN® MODEL M2®

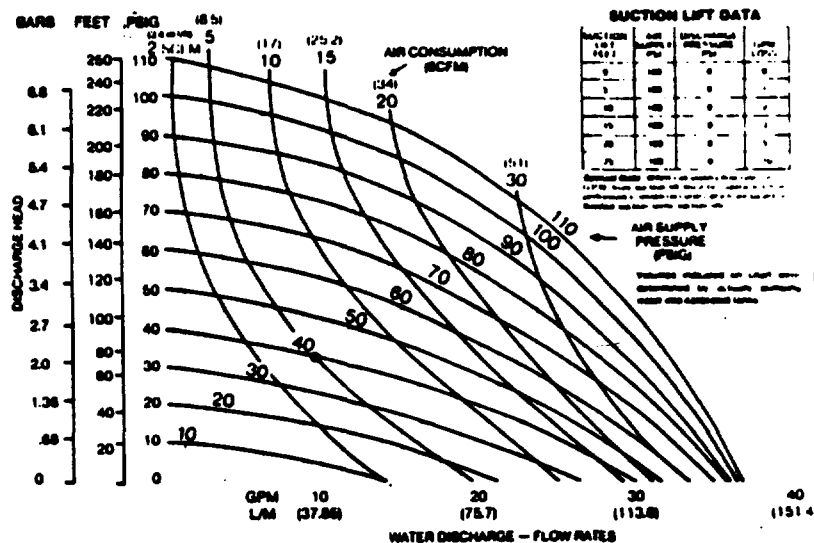
Height 10 1/2"
Width 10 1/2"
Depth 7"
Weight 22 lbs. ALUMINUM
SHAFT SEAL: TETON 35 lbs.
Air Inlet 1/2" N.P.T.
Inlet 1" Male N.P.T.
Outlet 1/2" Male N.P.T.
Suction Lift 18' Dry
25' Wet

Max. Size Solids 1/4" Dia.
Example: To pump 10 gpm
against a discharge pressure of
35 psig requires 40 psig and 5
scfm air consumption. (See dot
on chart.)

Note: For M2 pumps fitted with
Teflon diaphragms reduce water
discharge figures by 20%. Suction
lift for M2 pumps with Teflon
diaphragms: 10 ft. dry, 25 ft.
wet.

Caution: Do not exceed 125
psig air supply pressure.

M-2
For Flows to 37 GPM



WILDEN® MODEL M4®

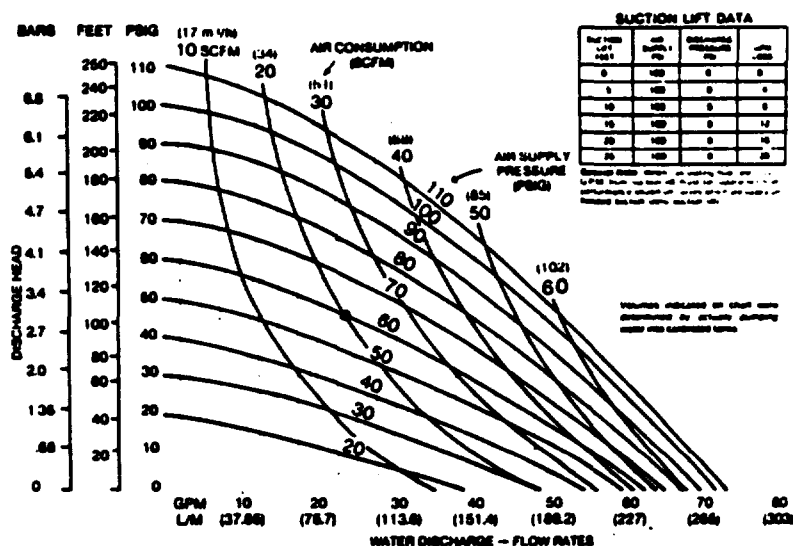
Height 18"
Width 14 1/2"
Depth 11 1/2"
Weight 35 lbs. ALUMINUM
HEAVY DUTY SHAFT SEAL: 52 lbs.
Air Inlet 1/2" N.P.T.
Inlet 1 1/2" Female N.P.T.
Outlet 1 1/2" Male N.P.T.
Suction Lift 22' Dry
27' Wet

Max. Size Solids 1/4" Dia.
Example: To pump 22.5 gpm
against a discharge pressure
head of 45 psig, requires 60 psig
and 20 scfm air consumption.
(See dot on chart.)

Note: For M4 pumps fitted with
Teflon diaphragms reduce water
discharge figures by 20%. Suction
lift for M4 pumps with Teflon
diaphragms: 12 ft. dry, 25 ft.
wet.

Caution: Do not exceed 125
psig air supply pressure.

M-4
For Flows to 73 GPM



EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

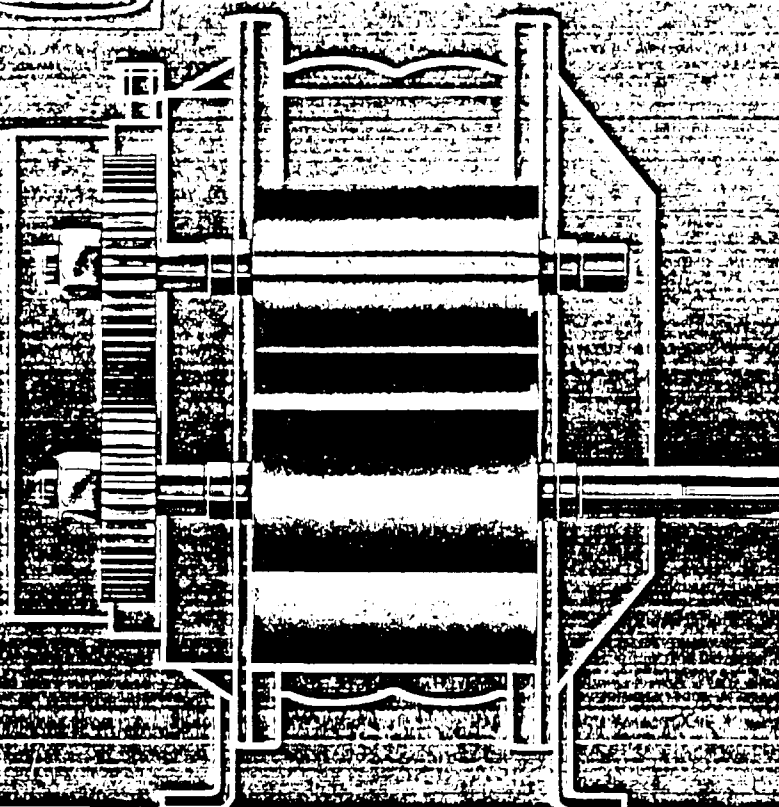
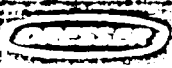
EQUIPMENT NO.	<u>SS2-B2 and SS2-B3</u>
NAME	<u>BIOTOWER BLOWERS</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>Roots Dresser Industries Inc.</u> <u>Connersville, IN 47331</u> <u></u> <u></u>
DISTRIBUTOR	<u>US Filter</u> <u>Lancy Environmental</u> <u>181 Thornhill Road, Warrendale, PA 15086</u> <u>412-772-0044</u>
DESCRIPTION	<u>Universal Rotary Positive Blower</u> <u>Model 53 RAI-U</u> <u>170 SCFM</u> <u>15HP, 460V, 3Ø TEFC</u> <u></u>
MAINTENANCE	<u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u>

Lancy Environmental Systems
Project No. F11110
Item Nos. B1902, B2001, B200

Universal RAI Rotary Positive Blowers

- versatile, economical
- flows to 2370 CFM
- vacuums to 16" Hg

ROOTS



HARRIS PUMP & SUPPLY CO.

PA. & W. VA. SUPPLY CO. TURNER

hps

5501 Campbells Run Road
Pittsburgh, PA 15205

412-787-7867 800-242-8909 Fax. 412-787-7696

ROOTS

IMPELLING QUALITY

Performance specifications

Pressure table

Frame Size	Speed RPM	1 PSI		2 PSI		4 PSI		6 PSI		7 PSI		8 PSI		10 PSI		12 PSI		15 PSI	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
22	1160	10	0.2	7	0.3	2	0.4												
	3600	49	0.6	46	0.8	41	1.3	38	1.8	36	2.1	35	2.3	32	2.8	29	3.3		
	5275	76	0.8	73	1.2	68	1.9	64	2.7	63	3.1	61	3.4	59	4.2	56	4.9		
24	1160	24	0.3	19	0.4	11	0.6												
	3600	102	0.8	97	1.3	89	2.3	83	3.3	81	3.8								
	5275	156	1.2	150	1.9	143	3.4	137	4.9	135	5.6								
33	1160	55	0.5	48	0.8	39	1.4	31	2.1	28	2.4								
	2800	156	1.2	149	2.0	140	3.5	132	5.0	129	5.7	126	6.5	120	8.0	116	9.5		
	3600	205	1.6	199	2.5	189	4.5	181	6.4	178	7.4	175	8.3	170	10.3	165	12.2		
36	1160	95	0.7	85	1.2	72	2.3	61	3.3	57	3.8								
	2800	262	1.7	253	3.0	239	5.4	229	7.9	224	9.2								
	3600	344	2.2	334	3.8	321	7.0	310	10.2	306	11.8								
42	860	38	0.4	32	0.6	24	1.1	18	1.5	15	1.8								
	1760	92	0.8	87	1.3	78	2.2	72	3.1	69	3.6	67	4.1	62	5.0	58	5.9		
	3600	204	1.7	198	2.6	190	4.5	183	6.4	181	7.4	178	8.3	173	10.2	169	12.1	163	15.0
45	860	79	0.6	68	1.1	53	2.0	42	2.9	37	3.4								
	1760	188	1.3	177	2.2	162	4.1	151	5.9	146	6.9	141	7.8	133	9.6				
	3600	410	2.6	400	4.5	385	8.3	374	12.1	369	14.0	364	15.9	356	19.7				
47	860	109	0.8	97	1.4	81	2.6	68	3.8	63	4.4								
	1760	253	1.6	241	2.8	225	5.3	212	7.7	206	8.9								
	3600	546	3.2	535	5.7	518	10.7	505	15.8	500	18.3								
53	700	72	0.6	63	1.0	51	1.8	42	2.6	38	3.0								
	1760	211	1.5	203	2.6	191	4.6	181	6.6	177	7.6	173	8.6	167	10.7	160	12.7		
	2850	355	2.5	346	4.1	334	7.4	325	10.7	321	12.3	317	14.0	310	17.2	304	20.5	295	25.4
56	700	123	0.9	110	1.6	92	2.9	78	4.3	72	4.9	66	5.6						
	1760	358	2.2	345	3.9	326	7.3	312	10.7	306	12.4	300	14.1	290	17.5				
	2850	598	3.6	585	6.4	567	11.9	553	17.3	547	20.1	541	22.8	531	28.3				
59	700	187	1.2	170	2.2	147	4.2	130	6.1										
	1760	529	3.0	513	5.5	490	10.5	472	15.4	464	17.9								
	2850	881	4.9	865	8.9	842	16.9	824	25.0	816	29.0								
65	700	140	1.0	126	1.8	107	3.3	93	4.8	86	5.5	80	6.3	70	7.8				
	1760	400	2.6	387	4.5	368	8.3	353	12.1	347	14.0	341	15.8	330	19.6	320	23.4	307	29.1
	2350	546	3.5	532	6.0	513	11.1	499	16.1	492	18.6	486	21.1	475	26.2	466	31.2	452	38.8
68	700	224	1.5	203	2.7	172	5.1	149	7.5	139	8.7	129	9.9						
	1760	643	3.8	621	6.8	591	12.9	567	18.9	557	22.0	548	25.0	530	31.0	515	37.1		
	2350	876	5.0	855	9.1	824	17.2	801	25.3	790	29.3	781	33.4	763	41.5	748	49.6		
615	700	420	2.6	380	4.8	323	9.3	279	13.8										
	1760	1205	6.4	1164	12.1	1107	23.5	1063	34.8										
	2350	1641	8.6	1601	16.1	1544	31.3	1500	46.5										
76	575	195	1.3	179	2.3	158	4.3	142	6.4	134	7.4	128	8.4	115	10.4				
	1400	526	3.2	511	5.7	490	10.6	473	15.5	466	17.9	459	20.4	447	25.3	436	30.2	421	37.6
	2050	788	4.7	772	8.3	751	15.5	734	22.7	727	26.3	721	29.9	708	37.1	697	44.2	682	55.0
711	575	362	2.2	336	4.0	299	7.7	271	11.4	258	13.3	247	15.1	226	18.8				
	1400	970	5.3	944	9.8	908	18.8	880	27.8	867	32.3	856	36.8	835	45.8				
	2050	1450	7.7	1424	14.3	1387	27.5	1359	40.7	1347	47.3	1335	53.9	1315	67.1				
718	575	600	3.3	563	6.3	510	12.3	470	18.4										
	1400	1590	8.1	1553	15.4	1500	30.1	1460	44.7										
	2050	2370	11.9	2333	22.6	2280	44.0	2240	65.5										

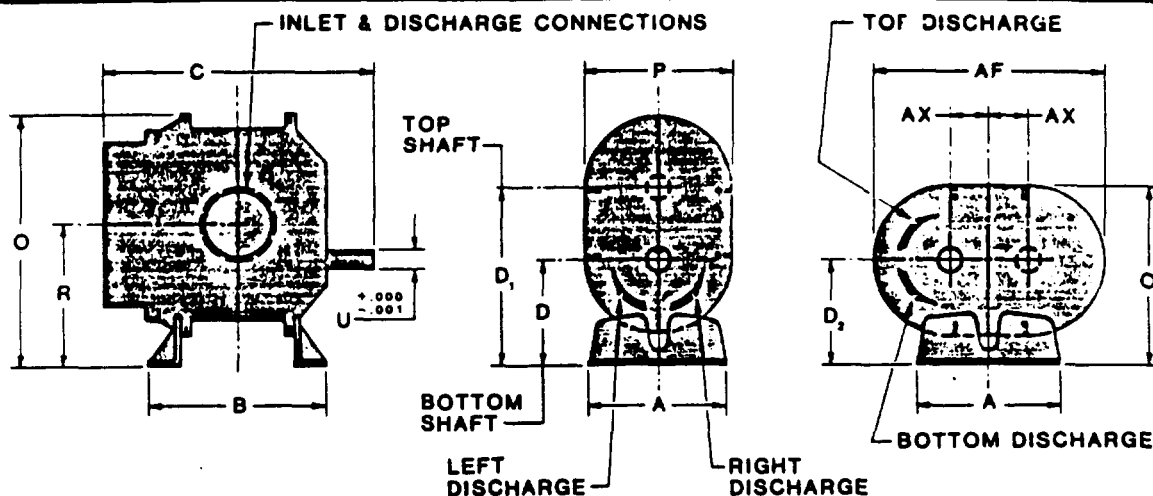
Ratings based on inlet air at standard temperature of 68° F, ambient pressure of 14.7 psia and specific gravity of 1.0.

vacuum table

Frame Size	Speed RPM	4" Hg Vacuum		6" Hg Vacuum		8" Hg Vacuum		10" Hg Vacuum		12" Hg Vacuum		14" Hg Vacuum		15" Hg Vacuum		16" Hg Vacuum	
		CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP	CFM	BHP
22	1160	6	0.3														
	3600	45	0.8	42	1.1	39	1.3	35	1.6	32	1.8	28	2.0				
	5275	72	1.2	69	1.6	66	1.9	62	2.3	59	2.6	55	3.0				
24	1160	18	0.4	12	0.6												
	3600	96	1.3	90	1.8	85	2.3	80	2.8	75	3.3	69	3.8				
	5275	149	1.9	144	2.6	139	3.4	134	4.1	128	4.8	122	5.5				
33	1160	47	0.8	40	1.1	33	1.4	27	1.7								
	2800	148	1.9	141	2.7	134	3.4	128	4.1	121	4.9	113	5.6				
	3600	197	2.5	190	3.4	184	4.4	177	5.3	170	6.3	163	7.2				
36	1160	83	1.2	74	1.7	65	2.2	55	2.7								
	2800	251	2.9	241	4.1	232	5.3	223	6.6	213	7.8						
	3600	332	3.7	323	5.3	313	6.9	304	8.4	294	10.0	284	11.6				
42	860	31	0.6	25	0.8	19	1.1										
	1760	85	1.3	79	1.7	74	2.2	68	2.6	62	3.1	56	3.5				
	3600	197	2.6	191	3.5	185	4.4	180	5.4	174	6.3	167	7.2				
45	860	66	1.1	56	1.5	46	1.9										
	1760	175	2.2	164	3.1	154	4.0	144	4.9	134	5.8						
	3600	398	4.4	387	6.3	377	8.2	367	10.0	356	11.9	345	13.7				
47	860	95	1.3	83	1.9	72	2.5										
	1760	239	2.8	227	3.9	216	5.1	205	6.3	193	7.5						
	3600	532	5.6	520	8.1	509	10.5	498	13.0	486	15.4	473	17.9				
53	700	61	1.0	53	1.4	44	1.8	36	2.2								
	1760	201	2.5	192	3.5	184	4.5	176	5.5	167	6.5	158	7.5				
	2850	345	4.1	336	5.7	328	7.3	320	8.9	311	10.5	301	12.1				
56	700	108	1.5	95	2.2	82	2.9	70	3.5								
	1760	342	3.9	329	5.5	316	7.2	304	8.8	291	10.5	276	12.1				
	2850	583	6.2	570	8.9	557	11.6	545	14.3	532	17.0	517	19.7				
59	700	167	2.1	151	3.1	135	4.1										
	1760	509	5.4	493	7.8	477	10.2	462	12.7	445	15.1						
	2850	861	8.7	845	12.6	829	16.6	814	20.5	797	24.4	779	28.3				
65	700	123	1.8	110	2.5	97	3.2	84	4.0	71	4.7						
	1760	384	4.4	371	6.3	358	8.1	345	10.0	331	11.8	317	13.7	308	14.6	300	15.5
	2350	529	5.9	516	8.4	503	10.8	490	13.3	476	15.8	462	18.2	454	19.5	445	20.7
68	700	198	2.7	177	3.8	156	5.0	135	6.2								
	1760	617	6.7	595	9.6	575	12.6	554	15.6	532	18.5	508	21.5	495	23.0		
	2350	850	8.9	828	12.9	808	16.8	787	20.8	765	24.7	741	28.7	728	30.7	715	32.6
615	700	371	4.7	331	6.9	292	9.1										
	1760	1156	11.8	1115	17.4	1077	23.0	1038	28.5	997	34.1						
	2350	1592	15.8	1552	23.2	1513	30.6	1474	38.1	1433	45.5						
76	575	176	2.3	161	3.3	147	4.3	132	5.2	117	6.2						
	1400	508	5.6	493	8.0	478	10.4	464	12.8	448	15.2	432	17.6	423	18.8	413	20.0
	2050	769	8.2	754	11.7	740	15.2	725	18.7	710	22.2	693	25.7	684	27.5	674	29.2
711	575	330	3.9	304	5.7	279	7.6	254	9.4	228	11.2						
	1400	939	9.6	913	14.0	888	18.4	863	22.8	837	27.2	808	31.6	793	33.8		
	2050	1419	14.0	1393	20.5	1368	26.9	1343	33.4	1317	39.8	1288	46.3	1272	49.5	1256	52.7
718	575	555	6.2	517	9.1	482	12.1	446	15.0								
	1400	1545	15.1	1507	22.3	1472	29.4	1436	36.6	1398	43.8						
	2050	2325	22.1	2287	32.6	2252	43.1	2216	53.6	2178	64.1						

Ratings based on inlet air at standard temperature of 68° F, discharge pressure of 30" Hg and specific gravity of 1.0.

same sizes



VERTICAL CONFIGURATION

HORIZONTAL CONFIGURATION

Frame Size	A	B	C	Drive Shaft Location			O	O'	P	R	U	Keyway	Inlet & Disch. Dia.	AF	AX	Approx. Net Wt. (Lbs.)
				D Bottom Shaft	D ₁ Top Shaft	D ₂ Horiz. Shaft										
22	5.13	5.00	9.75	3.75	6.25	3.75	9.63	6.88	6.25	5.00	.625	.188 x .094	1.0 NPT	9.25	1.25	32
24	5.13	7.00	11.75	3.75	6.25	3.75	9.63	6.88	6.25	5.00	.625	.188 x .094	2.0 NPT	9.25	1.25	43
33	7.25	7.63	12.13	5.00	8.50	5.00	12.81	8.88	7.75	6.75	.750	.188 x .094	2.0 NPT	12.13	1.75	74
36	7.25	10.00	14.63	5.00	8.50	5.00	12.81	8.88	7.75	6.75	.750	.188 x .094	2.5 NPT	12.13	1.75	102
42	8.00	7.25	13.00	6.25	10.25	6.25	15.06	10.63	8.75	8.25	.875	.188 x .094	1.5 NPT	13.63	2.00	88
45	8.00	10.00	15.50	6.25	10.25	6.25	15.06	10.63	8.75	8.25	.875	.188 x .094	2.5 NPT	13.63	2.00	109
47	8.00	11.75	17.63	6.25	10.25	6.25	15.06	10.50	8.50	8.25	.875	.188 x .094	3.0 NPT	13.63	2.00	128
53	10.50	8.38	15.38	6.25	11.25	6.75	17.38	11.88	10.25	8.75	1.125	.250 x .125	2.5 NPT	17.25	2.50	143
56	10.50	11.00	18.00	6.25	11.25	6.75	17.38	12.25	11.00	8.75	1.125	.250 x .125	4.0 NPT	17.25	2.50	170
59	10.50	14.00	21.18	6.25	11.25	6.75	17.38	12.25	11.00	8.75	1.125	.250 x .125	4.0 NPT	17.25	2.50	204
65	11.00*	10.00	18.38	8.75	14.75	8.75	21.63	15.13	12.75	11.75	1.375	.312 x .156	3.0 NPT	19.75	3.00	245
68	11.00*	13.00	21.38	8.75	14.75	8.75	21.63	15.13	12.75	11.75	1.375	.312 x .156	5.0 NPT	19.75	3.00	285
615	11.00*	20.00	28.38	8.75	14.75	8.75	21.63	16.25	15.00	11.75	1.375	.312 x .156	6.0 FLG	19.75	3.00	425
76	14.00**	11.75	19.94	11.00	18.00	11.00	26.13	20.69	19.38	14.50	1.562	.375 x .188	4.0 NPT	23.25	3.50	400
711	14.00**	16.75	25.19	11.00	18.00	11.00	26.13	19.50	17.00	14.50	1.562	.375 x .188	6.0 FLG	23.25	3.50	530
718	14.00**	23.75	32.19	11.00	18.00	11.00	26.13	19.50	17.00	14.50	1.562	.375 x .188	8.0 FLG	23.25	3.50	650

* 17.00 in horizontal configuration
 ** 21.00 in horizontal configuration

All dimensions in inches

ROOTS

DRESSER

Dresser Industries Inc.
ROOTS DIVISION
 800 West Mount Street, Connersville, Indiana 47331
 Phone: 317/827-8200 FAX: 317/825-7669

IMPRESSING QUALITY

RPH - 230/460/3/60 IEF

6 1 Browning 2BK65H Sheave

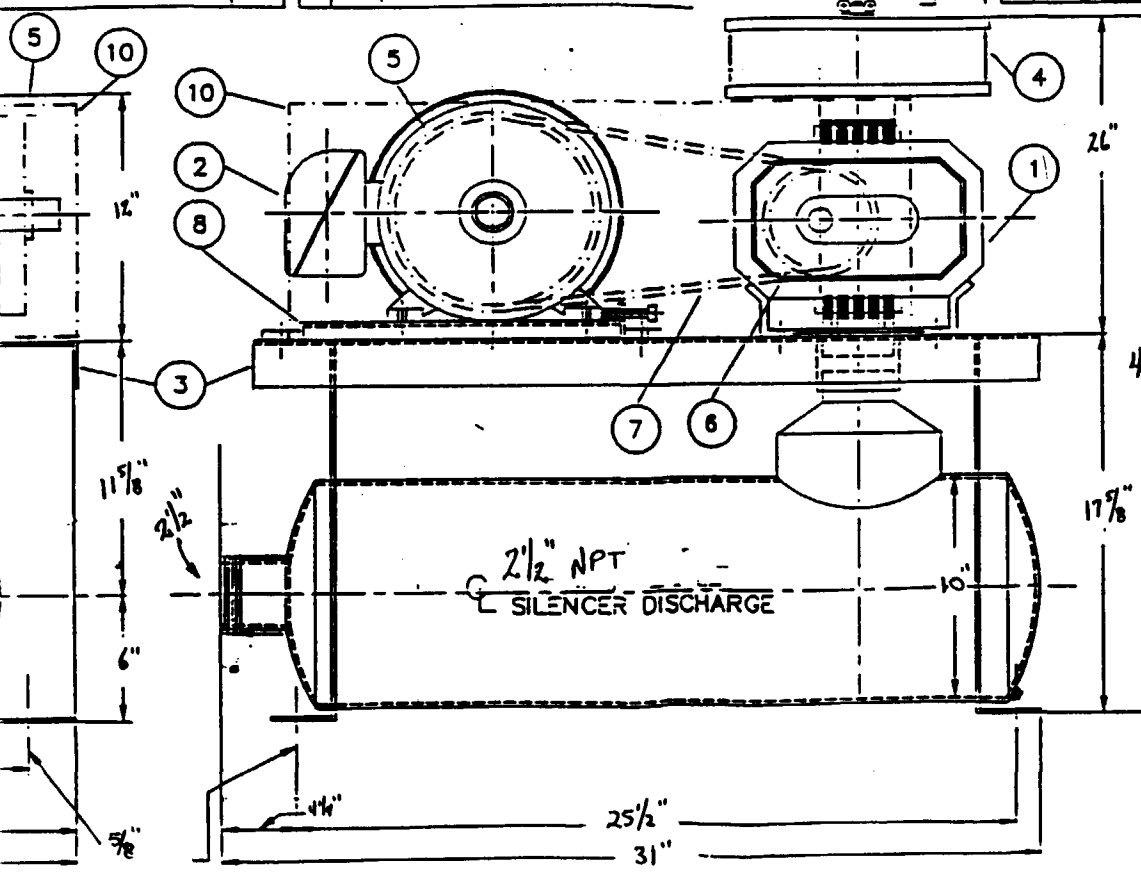
7 2 Browning BX52 Bal-

8 2 Motor Slide Rail

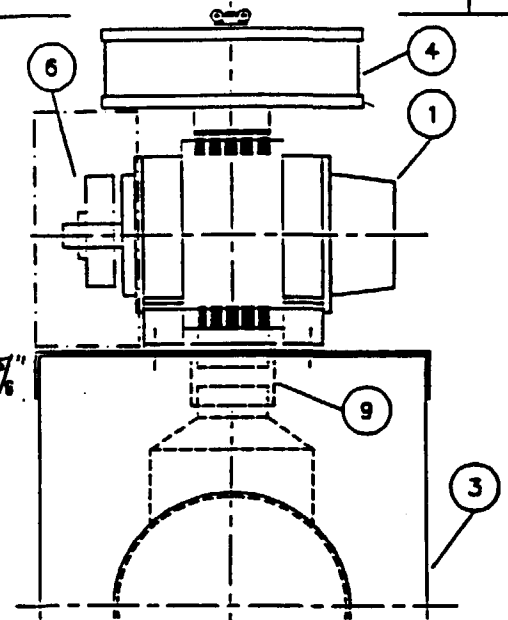
9 Roots Flex Connector 2-1/2T

1/2 Stoddard Silencer

ilter/Silencer



SIDE ELEVATION



INLET END ELEVATION

HPASco JOB NO.

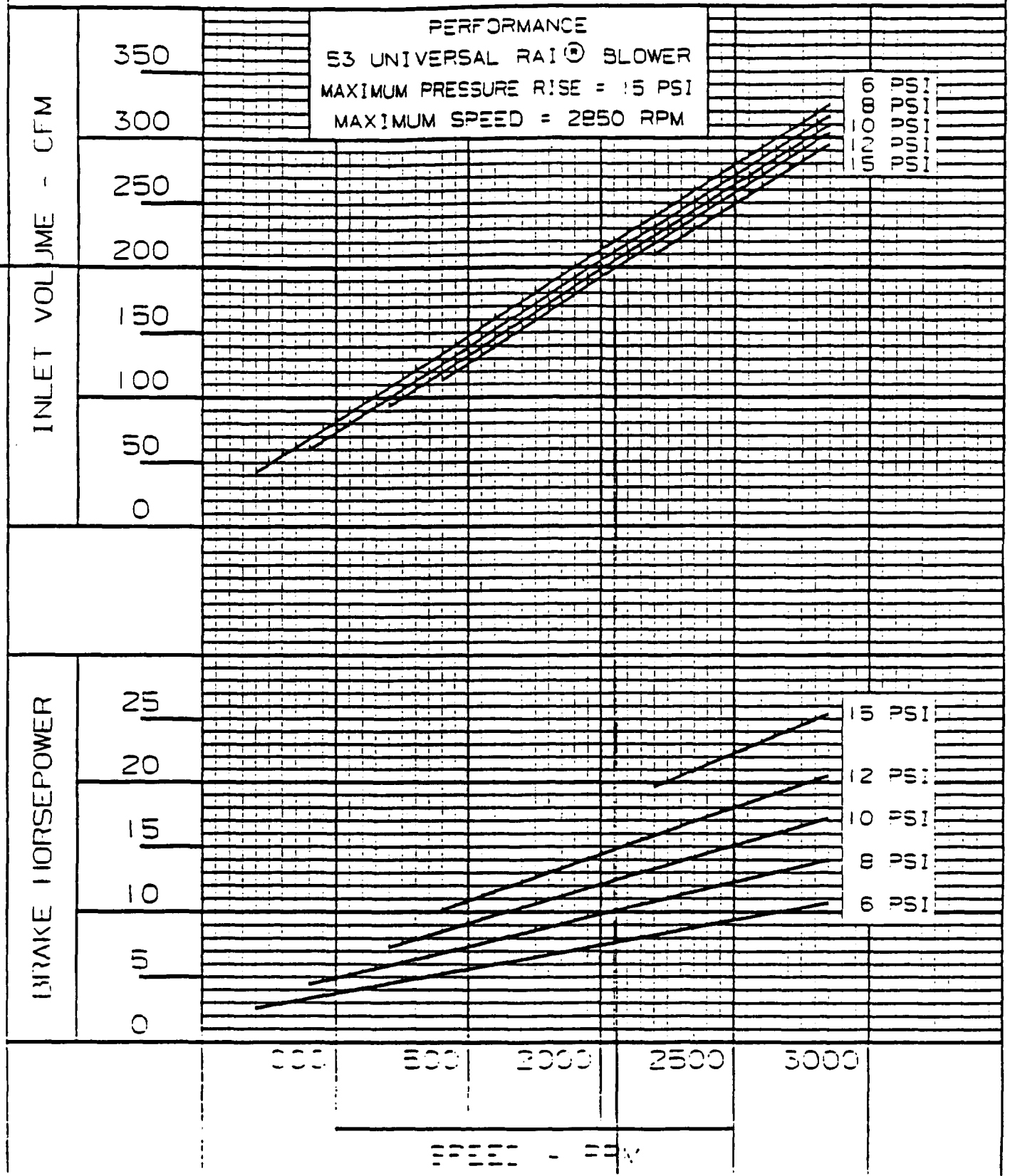
hps HARRIS PUMP & SUPPLY CO.
5501 CAMPBELL'S RUN ROAD - PITTSBURGH, PA 15208
(412) 767-7867 FAX (412) 767-7898
Lancy Environmental P.O. #L04986
#1902/B2001/B2002 BioTower Blowers
CAMPBELL'S RUN 5501 - M.F. - 5/17/92

TON DIA HOLES

ROOTS DIVISION
DRESSER INDUSTRIES, INC.
CONNEERSVILLE, IN. 47331
PRINTED IN U.S.A.

PERFORMANCE BASED ON INLET
AIR AT 14.7 PSIA & 68°F

JUNE 1990



EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-P12</u>
NAME	<u>BIOTOWER SLUDGE PUMP</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>Wilden Pumps</u> <u>22069 Van Buren</u> <u>P.O. Box 845</u> <u>Colton, CA 92324</u>
DISTRIBUTOR	<u>Glauber Equipment Corp.</u> <u>3940 Broadway</u> <u>Buffalo, NY 14227</u> <u>716-681-1234</u>
DESCRIPTION	<u>Model M-2</u> <u>Air Operated Diaphragm Pump</u> <u>Aluminum</u> <u>Flow 30 GPM at 50' head</u>
MAINTENANCE	<u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u>Wet end repair kit</u> <u>Dry end repair kit</u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u>

SPECIFICATIONS AND PERFORMANCE

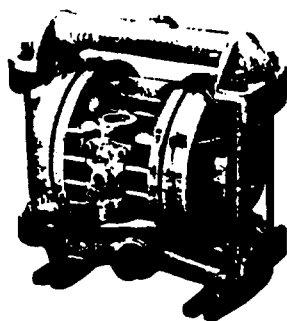
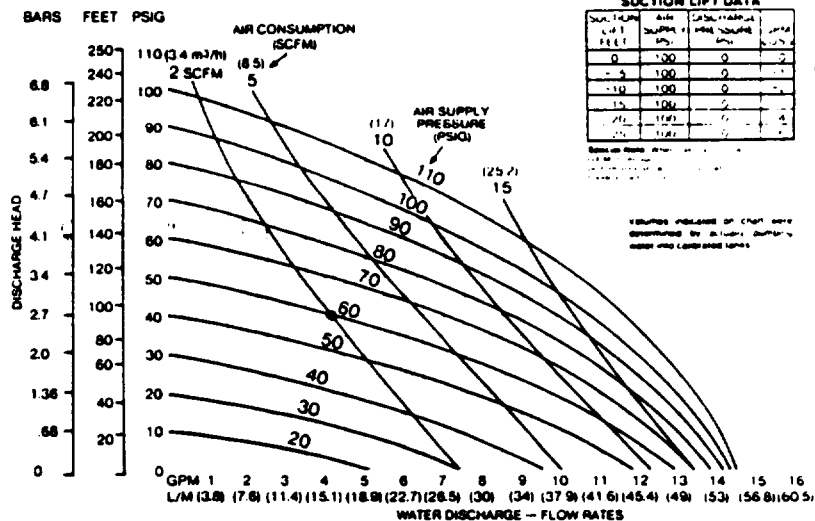


WILDEN® MODEL M1®

Height 8 1/2"
Width 8"
Depth 6 1/2"
Weight 11 lbs.
Air Inlet 1/2" Female N.P.T.
Inlet 1/2" Female N.P.T.
Outlet 1/2" Female N.P.T.
Suction Lift 15' Dry
25' Wet

Max. Size Solids 1/4" Dia.
Example: To pump 4 gpm against a discharge pressure of 40 psig requires 60 psig and 2 scfm air consumption. (See dot on chart.)
Caution: Do not exceed 100 psig air supply pressure.

M-1
For Flows to 14 GPM



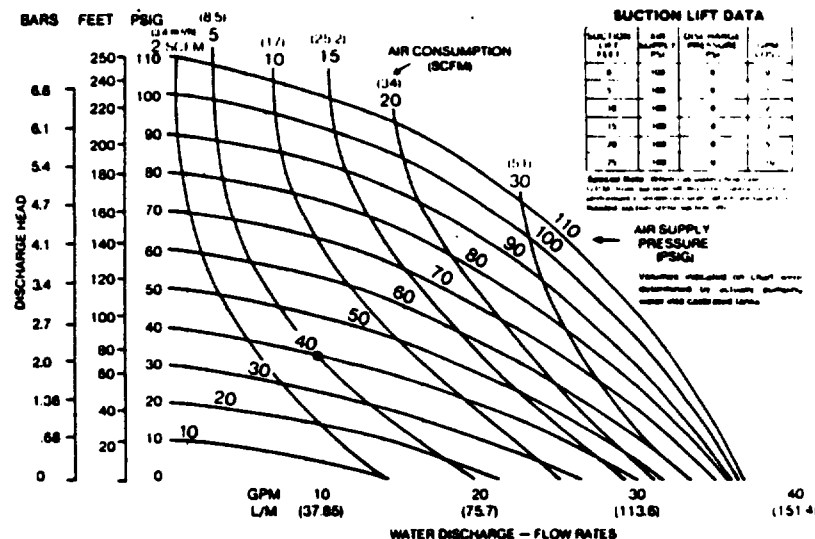
WILDEN® MODEL M2®

Height 10 1/2"
Width 10 1/2"
Depth 7"
Weight ALUMINUM 22 lbs.
STAINLESS/HAZELLOY 35 lbs.
Air Inlet 1/2" N.P.T.
Inlet 1" Male N.P.T.
Outlet 1/2" Male N.P.T.
Suction Lift 18' Dry
25' Wet

Max. Size Solids 1/2" Dia.
Example: To pump 10 gpm against a discharge pressure of 35 psig requires 40 psig and 5 scfm air consumption. (See dot on chart.)
Note: For M2 pumps fitted with Teflon diaphragms reduce water discharge figures by 20%. Suction lift for M2 pumps with Teflon diaphragms: 10 ft. dry, 25 ft. wet.

Caution: Do not exceed 125 psig air supply pressure.

M-2
For Flows to 37 GPM



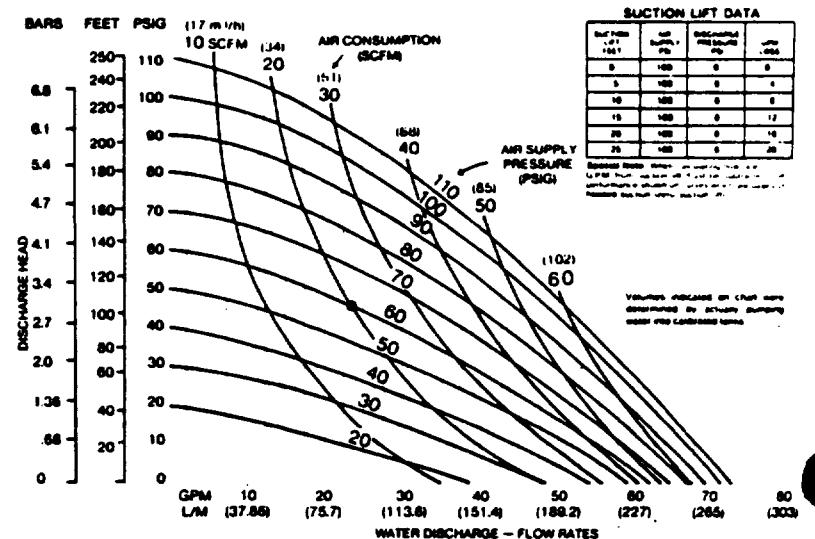
WILDEN® MODEL M4®

Height 18"
Width 14 1/2"
Depth 11 1/2"
Weight ALUMINUM 35 lbs.
HAZELLOY 52 lbs.
Air Inlet 1/2" N.P.T.
Inlet 1 1/2" Female N.P.T.
Outlet 1 1/2" Male N.P.T.
Suction Lift 22' Dry
27' Wet

Max. Size Solids 1/2" Dia.
Example: To pump 22.5 gpm against a discharge pressure head of 45 psig requires 60 psig and 20 scfm air consumption. (See dot on chart.)
Note: For M4 pumps fitted with Teflon diaphragms reduce water discharge figures by 20%. Suction lift for M4 pumps with Teflon diaphragms: 12 ft. dry, 25 ft. wet.

Caution: Do not exceed 125 psig air supply pressure.

M-4
For Flows to 73 GPM



EQUIPMENT SPECIFICATION FORM

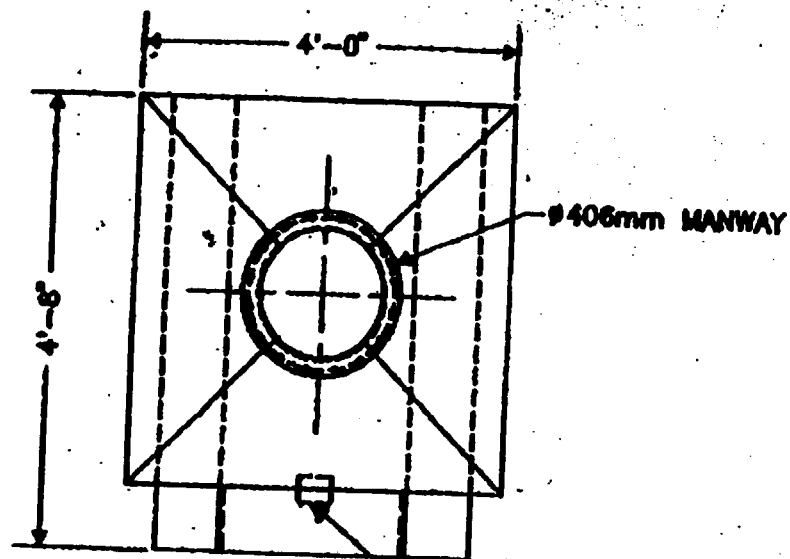
SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-P8</u>
NAME	<u>BIOTOWER RECIRCULATION PUMP</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	
DISTRIBUTOR	
DESCRIPTION	<u>SAME AS BIOTOWER FEED PUMP</u>
MAINTENANCE	
COMPONENT PARTS	
SPARE PARTS	

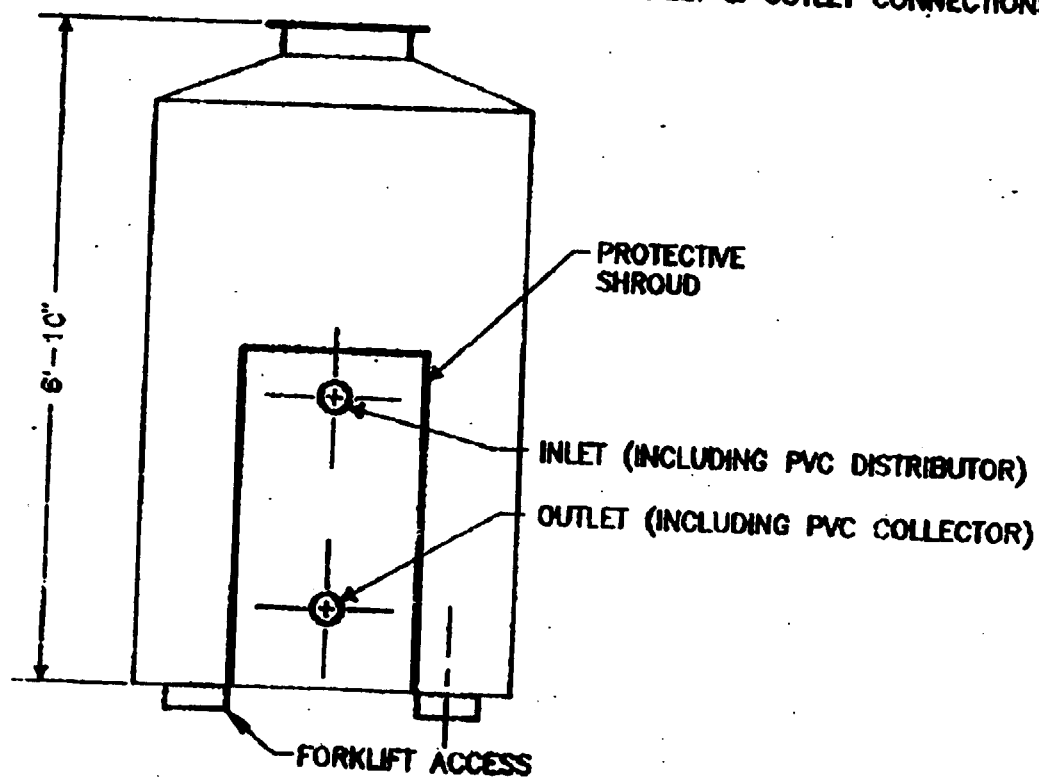
EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-C2</u>
NAME	<u>BIOTOWER VAPOR PHSE CARBON ADSORBER</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>ENCOTECH, Inc.</u> <u>P.O. Box 838</u> <u>Donora, PA 15033</u> <u>412-379-4555</u>
DISTRIBUTOR	<u></u> <u></u> <u></u> <u></u>
DESCRIPTION	<u>2000 lb. adsorber</u> <u>100 cfm</u> <u>4'OD, 7'OD</u> <u>Carbon steel with epoxy interior coating and</u> <u>epoxy exterior finish</u>
MAINTENANCE	<u>Replace carbon when spent</u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>



4" FPT INLET & OUTLET CONNECTIONS



PROTECTIVE SHROUD

INLET (INCLUDING PVC DISTRIBUTOR)

OUTLET (INCLUDING PVC COLLECTOR)

FORKLIFT ACCESS

NOTES:

- 1) ALL MATERIAL CARBON STEEL
UNLESS NOTED OTHERWISE
- 2) COUPLINGS: 304 SS
- 3) INTERIOR LINING: COAL TAR EPOXY
- 4) EXTERIOR FINISH: TILECLAD II EPOXY
- 5) CARBON CAPACITY: 2000#

DATE	REV	
DESIGNED BY	DATE	
CHECKED BY	DATE	
TRANSPORTABLE 2000# GAS PHASE ADSORBER		1-26

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-X3</u>
NAME	<u>SAND FILTER</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>Parkson Corp.</u> <u>2727 NW 62nd Street</u> <u>Ft. Lauderdale, FL 33309</u> <u>305-974-6610</u>
DISTRIBUTOR	<u>Siewert Equipment</u> <u>175 Akron Street</u> <u>Rochester, NY 14609</u> <u>716-482-9640</u>
DESCRIPTION	<u>Dynasand Filter Model DSF-12</u> <u>Continuous Backwash, Upflow</u> <u>12 sq. ft. filtration area</u> <u>4'ID, 12'H</u> <u>Maximum head loss 30" water pressure</u>
MAINTENANCE	<u>Inspect for leaks</u> <u>Clean as necessary</u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>

CONTINUOUS SAND FILTER

SAND FILTER SIZED TO HANDLE 50 GPM NORMALLY,
100 GPM MAX, WITH THE FOLLOWING PERFORMANCE:

<u>EFFLUENT</u>		<u>INFLUENT</u>	
20 ppm Fe	170 ppm Ca	60 ppm Fe	230 ppm Ca
80 ppm Mg	5-10 ppm TSS	110 ppm Mg	10 lb/day biomass
		pH 7-8	TEMP 50-70 F

BASED ON OUR SPECIFICATIONS, THE MODEL
RECOMMENDED BY THE VENDOR IS THE PARSON
DYNASAND FILTER MODEL 12 DSF

DYNASAND® FILTER

PACKAGED DYNASAND® FILTER

CONSULTANT:	TREATEK
CUSTOMER:	UNDISCLOSED
APPLICATION:	GROUNDWATER REMEDIATION
DATE:	August 3, 1992

PACKAGED DYNASAND® FILTER

1:00 SCOPE

- 1:01 This specification covers (1) packaged DynaSand Filter Model DSF-12, as manufactured by Parkson Corporation.
- 1:02 The filter shall consist of a cylindrical tank with a conical hopper; feed inlet and feed riser pipes, feed distribution hood; filtrate weir and flume; airlift pipe, internal sand washer, sand distribution cone(s), reject compartment with weir and flume and a compressed air control system.
- 1:03 The filter shall operate in a manner such that the total cross-sectional area of each filter shall be in a continuous filtration and a continuous backwash mode. There shall be no interruption of the filtration process by shutting down a part or a whole filter for backwashing.

2.00 DESIGN DETAILS - MECHANICAL

- 2.01 The filter shall be a continuous backwash, upflow, deep bed, single media filter. Mixed or multiple media shall not be allowed.
- 2.02 The filter shall operate countercurrently. The feed shall be upflow with sand moving downward.
- 2.03 Each filter shall provide a minimum of 12 sq.ft. of filtration area.
- 2.04 Each filter tank shall be 12'-0" in height and have an inside tank diameter of 4'-0".
- 2.05 Each tank shall come complete with 150# drilled flanged connections including a 4" feed connection, 3" reject connection, 6" filtrate connection, and a 1" drain connection.
- 2.06 Each tank shall have a wall thickness of 3/16".
- 2.07 The filter shall be designed for a filtration bed depth of 40".
- 2.08 The filter shall not contain any moving parts.
- 2.09 The filter shall not contain any screens, wedgewires, grids, etc., to retain the media in place.

2.10 The air supply system shall consist of a separate panel including an air filter, control valve, air flow meter, pressure regulator and pressure gauge.

2.11 The unit shall come complete with access ladder.

2.12 The filter shall be designed for Seismic Zone 1 installation.

3.00 DESIGN DETAILS - PROCESS

3.01 The units shall be designed to filter out suspended solids from a peak flow of 50 U.S. gpm of biotower effluent containing approximately 20 ppm TSS. Based on 12 sq. ft. of total filtration area, the loading rate shall be 4.2 gpm/sq.ft.

3.02 The filter shall produce a continuous filtrate stream and a continuous reject stream and shall not be shut down for any backwash cycles. No backwash valves, pumps, instrumentation shall be required for backwash cycles.

3.03 The sand bed shall be continuously backwashed internally and redistributed on top of the sand bed an average of 4-8 times per 24 hours.

3.04 Continuous sand cleaning shall be accomplished within the filter using filtered water. Filter influent (feed) shall not be used for sand cleaning.

3.05 The headloss through the filter shall not exceed 30".

3.06 The backwash surface loading rate shall exceed 150 gpm/sq.ft. to ascertain a superior scouring and cleaning of the sand.

3.07 The air scouring of the sand shall exceed 50 SCFM/sq.ft. This shall be accomplished by the supply of 1-4 SCFM of air at 15-25 psi. (Air supplied by the customer).

3.08 For multiple unit (cells) installation, the flow between filters (cells) shall be self-equilizing. No flow controls, regulators, etc. shall be required. Equilization shall not be accomplished by overflow weirs or feed recycle.

4.00 PERFORMANCE

4.01 Each bidder shall submit a list of at least five U.S. installations on similar applications which have been in continuous operation for at least two years.

4.02 Each bidder shall provide a written guarantee detailing filtrate quality. This guarantee shall be based upon laboratory filtration tests, on-site pilot tests, or past

operating experience. If the guarantee is based on past operating experience, documentation of that experience shall be submitted with the proposal.

5.00 MATERIALS OF CONSTRUCTION

DynaSand Filter Specifications:

Tank	FRP
Feed Inlet Risers	FRP
Feed Distributor Ring	FRP
Filtrate Weir & Flume	FRP
Reject Weir	FRP
Reject Flume	FRP
Central Compartment	FRP
Airlift Pipe	SS304/304L
Sand Washer Housing	FRP
Sand Washer Inserts	Polyethylene
Sand Distribution Cones	FRP

6.00 INSTALLATION

6.01 Each bidder shall submit general installation procedures with the proposal for the proposed unit along with an accurate time estimate for complete installation.

7:00 SURFACE PREPARATION

For DynaSand Filters manufactured in carbon steel, all carbon steel surfaces shall be sandblasted in accordance with the Steel Structures Painting Council Surface Preparation ANSI SSPC SP-06 "Commercial Blast Condition", latest edition on all non-wetted surfaces and ANSI SSPC-SP-10 "Near White Metal Blast Condition" for all wetted surfaces.

7:01 Paintings & Coatings

For DynaSand Filters manufactured in carbon steel, all carbon steel surfaces shall be epoxy painted as follows:

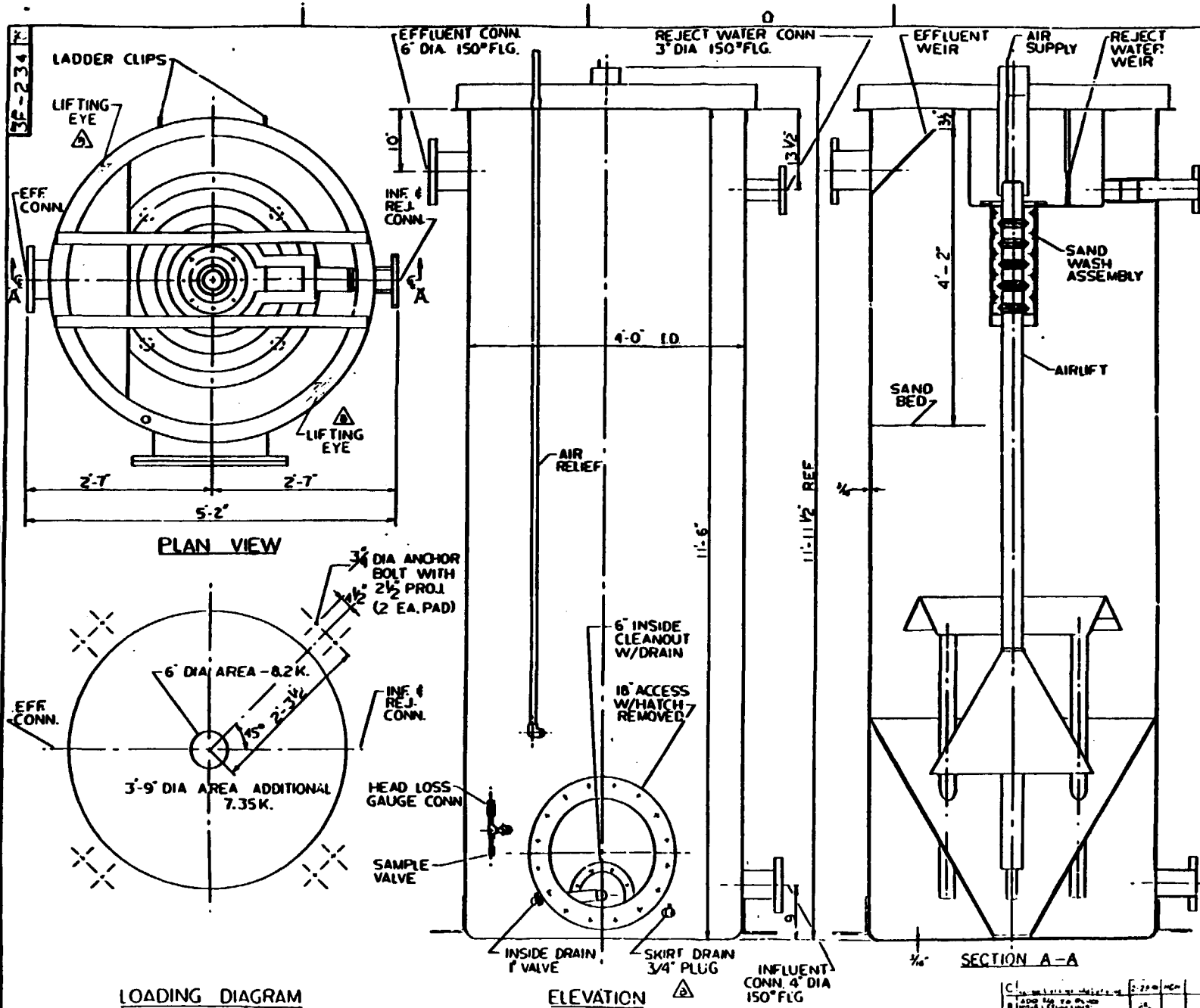
Exterior Surfaces:

- A. The base coat shall be DuPont High Solids Epoxy Mastic LF-63325P shale gray at a spread rate of 5-6 mils DFT.
- B. The finish coat shall be DuPont High Solids 50P Polyacryl Anhydride Enamel, Safety Blue at a spread rate of 1.5 - 2.5 mils DFT.
- C. Total DFT shall be 6.0 mils minimum average.
- D. Primer and paint shall be applied in accordance with coating manufacturer's recommendations.

Interior Surfaces:

- A. The base coat shall be DuPont High Solids Epoxy Mastic LF-63325P shale gray at a spread rate of 5-6 mils.
- B. The finish coat shall be DuPont Solids Epoxy Mastic LF-65M25P Safety Blue at a spread rate of 5-6 mils DFT.
- C. Total DFT shall be 10.0 mils minimum average.
- D. Primer and paint shall be applied in accordance with coating manufacturer's recommendations.

7.02 Stainless steels, nickel, monel, lead Hastelloy, galvanized steel, rubber, plastic or fiberglass surfaces, and fasteners shall not be painted.



- NOTES:**
- THIS DRAWING TO BE USED FOR GENERAL INFORMATION ONLY. **NOT FOR CONSTRUCTION**
 - MATERIALS OF CONSTRUCTION:**
TANK - FRP
 - WEIGHTS:**
SHIPPING WEIGHT - 850"
TANK & SAND - 7400"
TANK W/ SAND & WATER - 15500"
 - A FLAT HORIZONTAL FOUNDATION MUST BE PROVIDED FOR THE FILTER WITH THE BEARING AS ON THE LOADING DIAGRAM.
 - STAKES HAVE TO BE GROUTED.
 - AIR CONTROL PANEL AND HEAD LOSS GAUGE NOT SHOWN.

PRELIMINARY
 FOR INFORMATION ONLY
 NOT FOR CONSTRUCTION

Rev	By	Checked	Design	Approval	Stamp	Notes
0-6-14						
<div> <div> Parkson <small>OPERATIONS</small> </div> <div> DynaSand <small>GENERAL ARRANGEMENT</small> </div> </div>						
12 FT						

3E-231

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-T8</u>
NAME	<u>SURGE TANK #2</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>Nalgene Industrial Products Group</u> <u>Nalge Company, P.O. Box 20365</u> <u>Rochester, NY 14602</u> <u>716-586-8800</u>
DISTRIBUTOR	<u>Korus Equipment Company</u> <u>P.O. Box 631</u> <u>Buffalo, NY 14226</u> <u>716-839-1908</u>
DESCRIPTION	<u>Model 51109-180</u> <u>1100 gallon HDPE</u> <u>Flat Bottom, Dished Top</u> <u>64"OD, 93"H</u>
MAINTENANCE	<u>Inspect for leaks</u>
COMPONENT PARTS	
SPARE PARTS	

SURGE TANK #2

TANK TO PROVIDE ~ 1100 GAL VOLUME OF
WATER FOR PUMPING INTO CARBON ADSORBERS

HDPF TANK

5.3 ft dia x 7.75 ft H

$$\pi \left(\frac{5.3 \text{ ft}}{2} \right)^2 (7.75 \text{ ft}) \left(\frac{7.48 \text{ gal}}{\text{ft}^3} \right) = 1280 \text{ gal}$$

1100 gal OPERATING VOLUME

At 50 gpm

$$\frac{1100 \text{ gal}}{50 \text{ gpm}} = 22 \text{ min RETENTION TIME}$$

At 100 gpm

$$\frac{1100 \text{ gal}}{100 \text{ gpm}} = 11 \text{ min RETENTION TIME}$$

Vertical Bulk Storage Tanks

Nalgene Vertical Storage Tanks have a number of unique features. The entire line offers:

- Sizes ranging from 550 gallons to 12,500 gallons
- Seamless construction
- Leakproof design
- Mounting flats on the bottom portion of the tank
- Choice of two resins (XLPE, HDPE) and two specific gravities (1.5, 1.9)
- Tie-down lugs
- Translucent; observable liquid level; tanks up to 4000 gallons are gray (XLPE) or natural (HDPE); XLPE tanks larger than 4000 gallons are green

Features common to tanks from 550 to 4000 gallons include:

- Circular top head flat for fittings (excluding 550-gallon size)
- Molded-in calibrations
- Several manway options

Nalgene Vertical Storage Tanks have flat bottoms for easy installation. Smaller tanks (550-1550 gallons) incorporate narrow-diameter design for space-saving bulk storage. This makes them economical for in-plant use. Standard 16-in. lever-lock cover simplifies manway opening and closing.

Tanks are engineered for tough applications. They provide excellent low-temperature impact resistance and are UV stabilized for outdoor use.

Fittings and other accessories can be added as specified to meet your requirements. Options are found on pages 10-11.

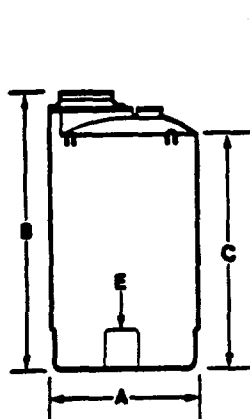
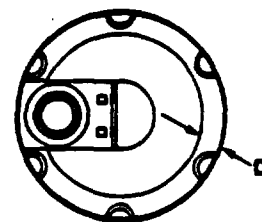
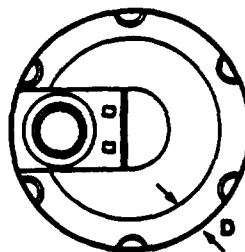
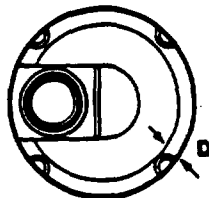
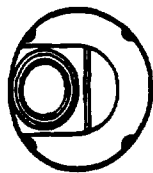
On request, Nalge Company will hydrostatically test your bulk storage tanks. Contact Nalge Industrial Department for details.

Note: All dimensions noted on tank drawings are nominal. Vertical tanks from 550 to 4000 gallons do not include fittings, which must be ordered separately. Tanks over 4000 gallons have one 2-in. standard PVC fitting.

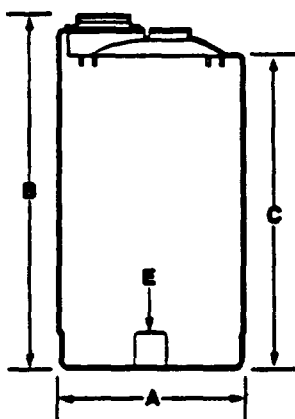
VERTICAL TANKS

Tank Size, Gallons	D x H, in.	Specific Gravity	Material		XLPE Wall Thickness,* inches	XLPE Approx. Weight, pounds	Standard Manway, inches
			XLPE Cat. No., Size Code	HDPE Cat. No., Size Code			
550	48 x 84	1.5	—	—	—	—	—
		1.9	51309-0550	51109-0550	.25	140	16
850	64 x 74	1.5	51305-0850	51105-0850	.25	150	16
		1.9	51309-0850	51109-0850	.28	170	16
1100	64 x 93	1.5	51305-1100	51105-1100	.31	190	16
		1.9	51309-1100	51109-1100	.37	220	16
1550	64 x 127	1.5	51305-1550	51105-1550	.34	280	16
		1.9	51309-1550	51109-1550	.41	415	16
2000	96 x 83	1.5	51305-2000	51105-2000	.31	320	16
		1.9	51309-2000	51109-2000	.44	445	16
2500	96 x 99	1.5	51305-2500	51105-2500	.38	430	16
		1.9	51309-2500	51109-2500	.50	625	16
3000	96 x 116	1.5	51305-3000	51105-3000	.44	620	21
		1.9	51309-3000	51109-3000	.56	800	21
3000 90-in. dia.	90 x 126	1.5	51305-3090	51105-3090	.44	620	21
		1.9	51309-3090	51109-3090	.56	800	21
4000	96 x 145	1.5	51305-4000	51105-4000	.56	850	21
		1.9	51309-4000	51109-4000	.81	1100	21
4000 90-in. dia.	90 x 162	1.5	51305-4090	51105-4090	.56	850	21
		1.9	51309-4090	51109-4090	.81	1100	21
5600	142 x 101	1.5	41305-5650	—	.44	950	18
		1.9	41309-5650	—	.57	1150	18
7000	142 x 120	1.5	41305-7050	—	.64	1060	18
		1.9	41309-7050	—	.81	1350	18
10,500	142 x 168	1.5	41305-9105	—	.82	2030	18
		1.7	41307-9105	—	.96	2180	18
12,500	142 x 197	1.5	41305-9125	—	.95	2700	18
		1.7	41307-9125	—	1.11	2900	18

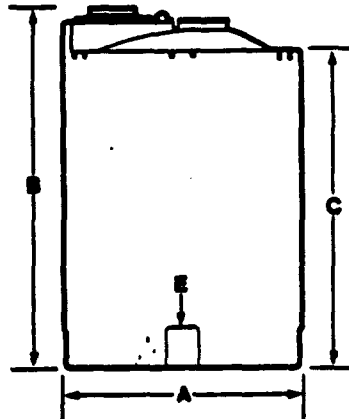
*Wall thickness based on bottom side wall.



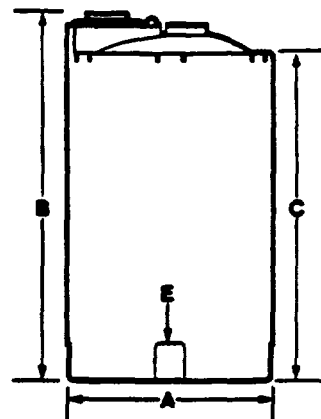
550-GAL TANK



850-, 1100-, 1550-GAL TANKS



2000-, 2500-, 3000-, 4000-GAL TANKS

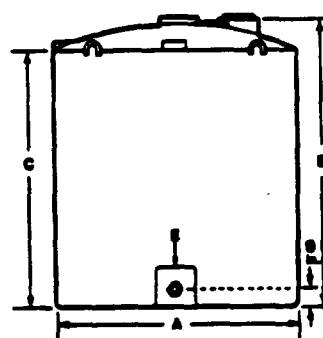
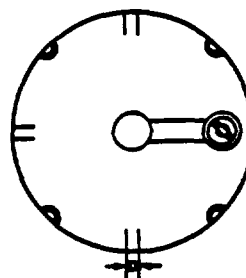


3000-, 4000-GAL TANKS (90-in. DIA.)

VERTICAL TANKS

Tank Size, Gallons	A, in.	B, in.	C, in.	D, in.	E, in.	Standard Fittings No.	Standard Fittings Size, in.
550	48	84	72	—	11 x 12	—	—
850	64	74	82	6	11 x 12	—	—
1100	64	93	79	6	11 x 12	—	—
1550	64	127	113	6	11 x 12	—	—
2000	96	83	66	12	13 x 16	—	—
2500	96	99	82	12	13 x 16	—	—
3000	96	116	99	12	13 x 16	—	—
3000 22-24	90	126	109	9	7 x 9	—	—
4000	96	145	128	12	13 x 16	—	—
4000 22-24	90	162	145	9	7 x 9	—	—
5600	142	101	86	15	12 x 12	1	2 HD*
7000	142	120	105	15	12 x 12	1	2 HD
10,500	142	168	153	15	12 x 28	1	2 HD
12,500	142	197	182	15	12 x 28	1	2 HD

*Heavy-duty PVC



5600-, 7000-, 10,500-, 12,500-GAL TANKS

Note: When factory-installed fittings are required, you must provide us with the catalog number for each fitting, catalog number for each tank, and drawings (freehand is acceptable) of each tank with its fitting(s).



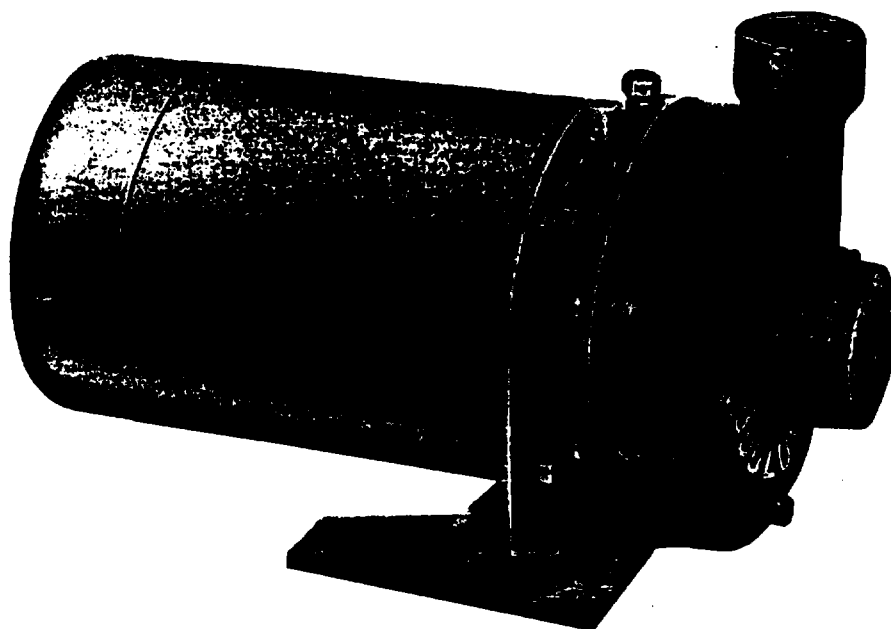
Call your distributor
to order these Nalgene Industrial Products.



EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-P9 and SS2-P10</u>
NAME	<u>SURGE TANK TRANSFER PUMPS</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>G&L Goulds Pumps</u> <u>P.O. Box 330</u> <u>Seneca Falls, NY 13148</u> <u>315-568-2811</u>
DISTRIBUTOR	<u>Pump & Compressor Equipment, Inc.</u> <u>570 Elk Street</u> <u>Buffalo, NY 14210</u> <u>716-823-1504</u>
DESCRIPTION	<u>Close coupled Centrifugal Pump</u> <u>Model 3642</u> <u>50 GPM at 50' head each</u> <u>1 1/4 x 1 1/2-5, 3500 RPM, 1 1/2 HP, 230/460 V</u> <u>3 phase</u>
MAINTENANCE	<u>Inspect for leaks</u> <u> </u> <u> </u> <u> </u> <u> </u>
COMPONENT PARTS	<u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u>
SPARE PARTS	<u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u>



G & L Close-Coupled Centrifugal Pumps

MODEL

3642

APPLICATIONS

Specifically designed for the following uses:

- Water Circulation
- Booster Service
- Liquid Transfer
- Spraying Systems
- Jockey Pump Service
- General Purpose Pumping

SPECIFICATIONS

Pump:

- Capacities to 110 GPM
- Heads to 118 feet
- Pipe connections:

MODEL	SUCTION	DISCHARGE
1 x 1¼ - 5	1¼" NPT	1" NPT
1¼ x 1½ - 5	1½" NPT	1¼" NPT

- Maximum working pressure: 125 PSI
- Temperature: standard seal — 212° F, (100° C) maximum. Optional high temperature seal — 250° F, (121° C) maximum.
- Rotation: right hand i.e.; clockwise when viewed from motor end.

Motor:

- NEMA Standard
- Open drip proof, TEFC, or (Explosion proof three phase only) enclosures.
- 60 Hz, 3500 RPM
- Stainless steel shaft
- Single phase: 115/230 volt, ½-2 HP ODP, ½-2 HP TEFC. Built-in overload with automatic reset.
- Three phase: ½-2 HP: ODP, 208-230/460 volt ½-2 HP: TEFC, 208-230/460 volt ½-2 HP: expl. proof, 230/460 volt
- Overload protection must be provided in starter unit. Starter and heaters (3) must be ordered separately.

FEATURES

Compact Design: Close coupled space saving design provides a installation. Flexible couplings and bedplates not required.

Mounting: Can be mounted in vertical or horizontal position.

Construction: Available in bronze fitted (BF), all iron (AI) or all bronze (AB). Bronze fitted means bronze impeller.

Impeller: Enclosed design for high efficiencies. Threaded discharge on motor shaft. Stainless steel locknut on three phase models, requires no clearance adjustment. Balanced for smooth operation.

Casing: Volute type, cast iron or bronze construction. Back plate design. Discharge can be rotated in eight positions. Vertical discharge standard. Tapped openings provided for priming, venting, and draining.

Mechanical Seal: Standard carbon/ceramic faces, BUNA elastomers, 300 Series stainless steel components. Option seals available.

Motor: Close-coupled design. Ball bearings carry all radial and thrust loads. Designed for continuous operation. All ratings are within working limits of the motor.

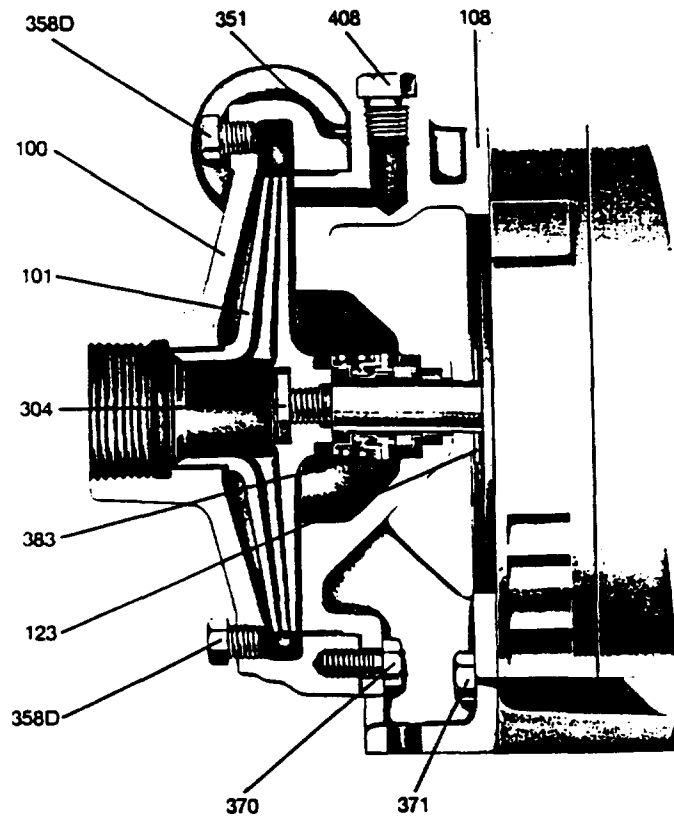
G & L

Close-Coupled Centrifugal Pumps

MODEL



3642



PARTS

Item No.	Part Name	Material		
		Bronze Fitted	All Iron	All Bronze
100	Casing	1001	1001	1102
101	Impeller	1102	1001	1102
108	Adapter	1001	1001	1102
123	Water Deflector	Rubber or Micarta®		
304	Impeller Nut*	Stainless Steel		
351	Gasket-Casing	Composite		
358D	Pipe Plug 1/4" Vent and Drain	Steel	Steel	Brass
370	H. HD Cap Screw Adapter to Case	Steel		
371	H. HD Cap Screw Adapter to Motor	Steel		
383	Mechanical Seal			
	10K10	Std.	Service Rotary Stationary Elastomers Metal Parts	
			General Ceramic	
	10K6		Heavy Duty	BUNA
	10K18	Opt.	Hi Temp.	EPR 18-8 S.S.
	10K24		Chem. Duty	Viton
408	Pipe Plug-Priming 1/4" NPT	Steel		Brass

* Impeller nut furnished on 3 phase units only.

MATERIALS OF CONSTRUCTION

Material Code	Engineering Standard
1001	Cast Iron ASTM A48 CL 20
1102	Bronze ASTM B584

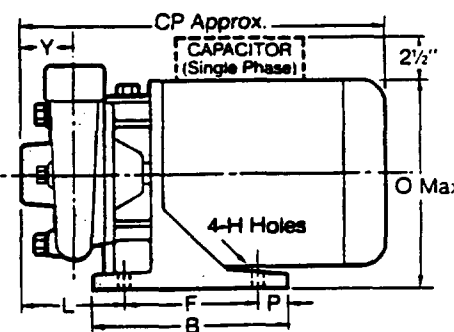
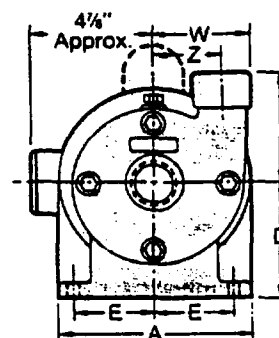
MOTOR FRAME

Motor Frame	1 Phase		3 Phase	
	ODP	TEFC	ODP	TEFC/EXPL
48	1/2	—	—	—
56	1/2-2	1/2-2	1/2-2	1/2-2

DIMENSIONS AND WEIGHTS

Pump	A	B	D	E	F	H	L	O	P	W	X	Y	Z	CP	Motor Frame	Weight (Lbs.)
1 x 1 1/4-5							3 1/4	7				2 1/8	3 1/8	13 1/2	48	55
	6 1/4	5 1/4	4 1/4	2 1/4	5	1 1/2	7 1/4	1 1/8	4	4				15 1/2	56	67
1 1/4 x 1 1/2-5							3 1/4	7 1/4				2 1/4	3 1/8	15 1/2	56	68

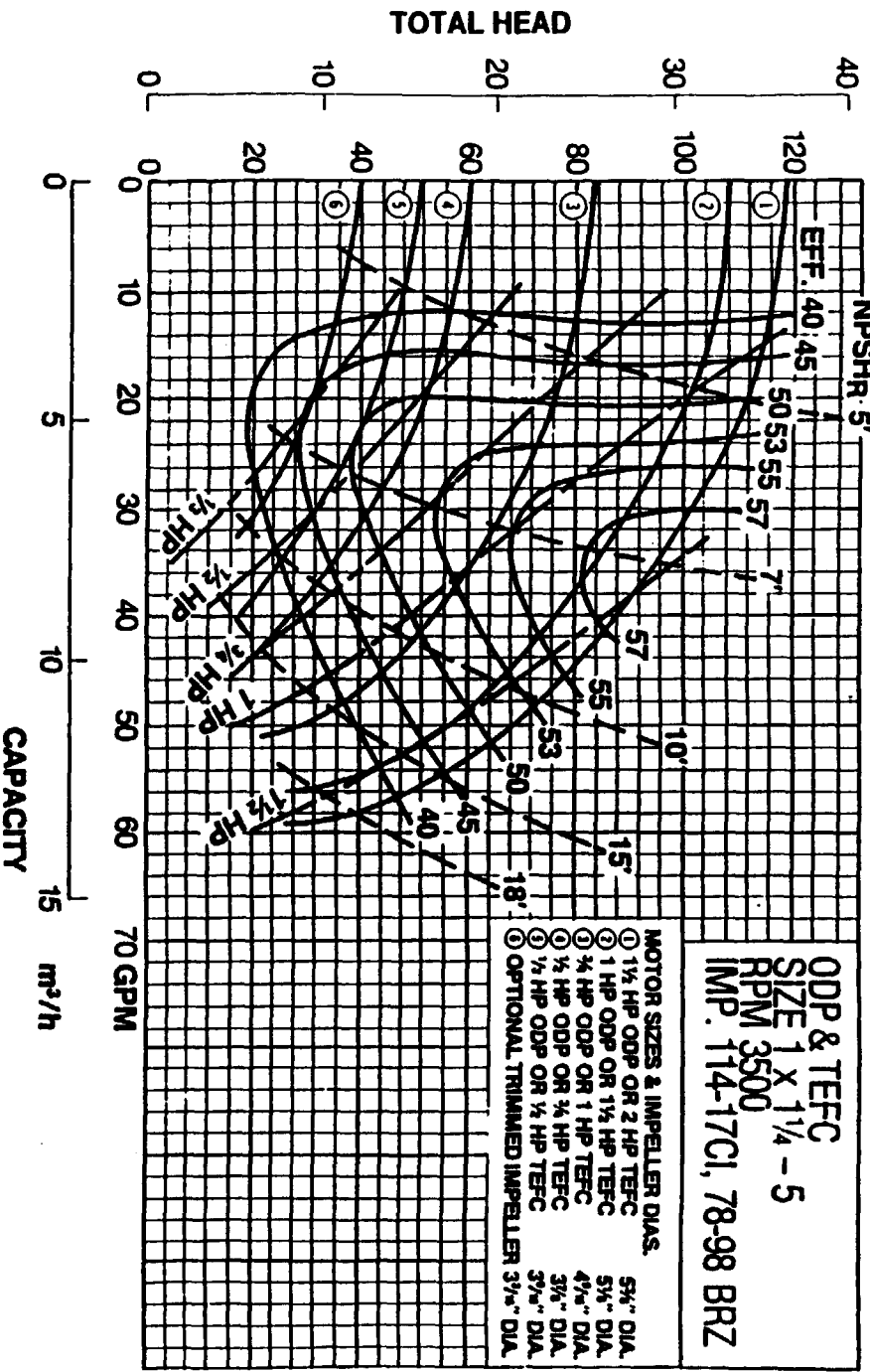
(All dimensions in inches and weight in lbs.)
(Do not use for construction purposes.)



SECTION 1
MODEL
3642

3642

TNPSHR-5

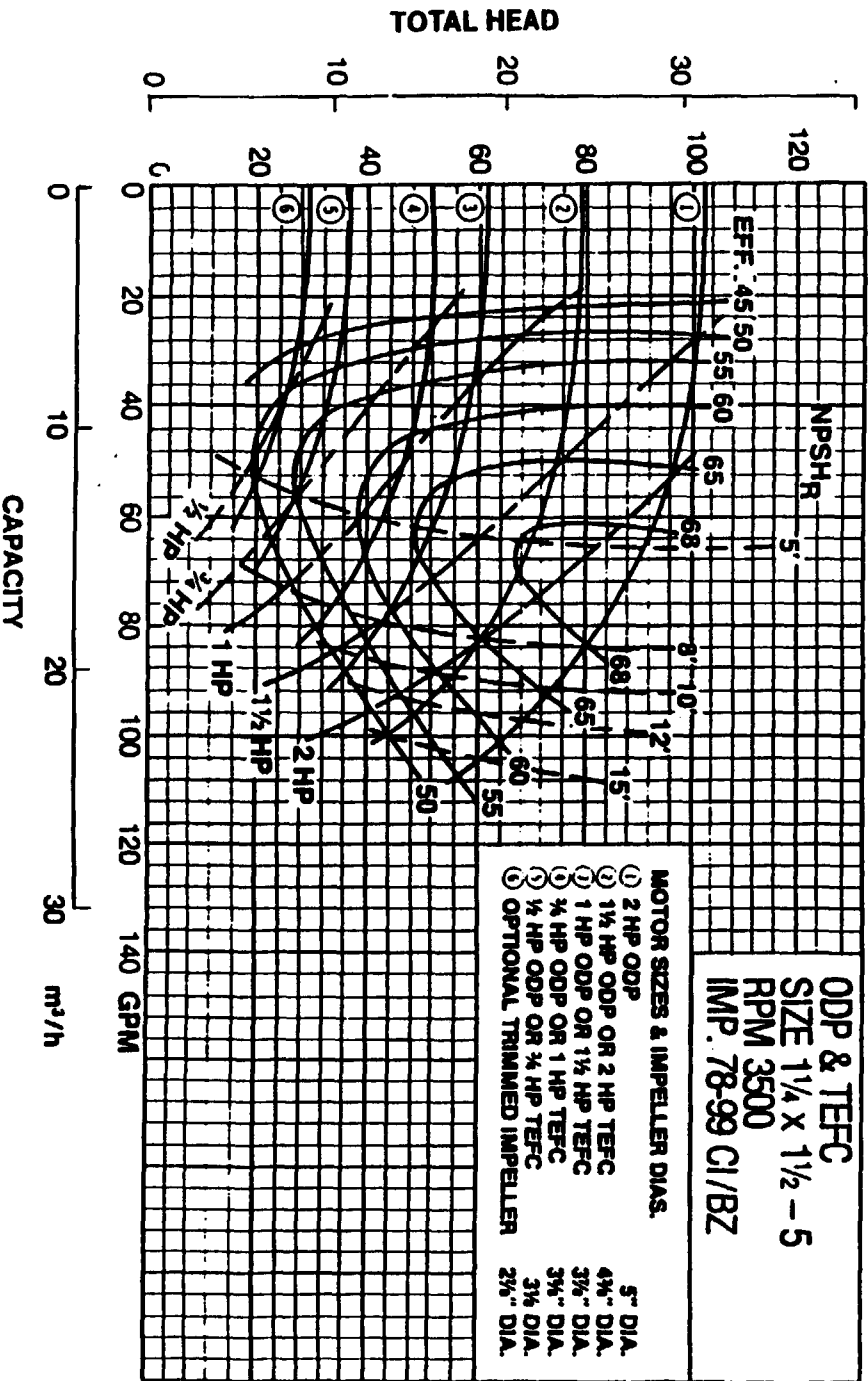


ODP & TEFC
SIZE 1 X 1 1/4 - 5
RPM 3500
IMP. 114-17CI, 78-98 BRZ

MOTOR SIZES & IMPELLER DIAS.

① 1½ HP ODP OR 2 HP TFC	5½" DIA.
② 1 HP ODP OR 1½ HP TFC	5½" DIA.
③ ¾ HP ODP OR 1 HP TFC	4¾" DIA.
④ ½ HP ODP OR ¾ HP TFC	3¾" DIA.
⑤ ¼ HP ODP OR ¼ HP TFC	3¾" DIA.
⑥ OPTIONAL TRIMMED IMPELLER	3¾" DIA.

METERS FEET



ODP & TEFC
SIZE 1 1/4 x 1 1/2 - 5
RPM 3500
IMP. 78-99 CI/BZ

MOTOR SIZES & IMPELLER DIAS.

- ① 2 HP ODP 5" DIA.
- ② 1½ HP ODP OR 2 HP TEFC 4¾" DIA.
- ③ 1 HP ODP OR 1½ HP TEFC 3¾" DIA.
- ④ ¾ HP ODP OR 1 HP TEFC 3¼" DIA.
- ⑤ ½ HP ODP OR ¾ HP TEFC 3" DIA.
- ⑥ OPTIONAL TRIMMED INPELLER 2½" DIA.

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-X4 and SS2-X5</u>
NAME	<u>LIQUID PHASE CARBON ADSORBERS</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>Encotech Inc.</u> <u>P.O. Box 838</u> <u>Donora, PA 15033</u> <u>412-379-4555</u>
DISTRIBUTOR	<u></u> <u></u> <u></u> <u></u>
DESCRIPTION	<u>2-20,000 lb adsorbers for a 1 train x 2 stage system</u> <u>Skid Mounted</u> <u>10'OD, 10'H each vessel, ASME code, 75 PSIG design</u> <u>28'L, 13'W, 21'H</u> <u>Piping and valves</u>
MAINTENANCE	<u>Replace carbon upon breakthrough</u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>

CARBON ADSORPTION

SYSTEM SIZED FOR 42 gpm NORMAL AND 100 gpm MAXIMUM FLOW WITH POTENTIAL FOR FULL CONCENTRATION CONTAMINANTS FROM INFLUENT FLOW FOR WORST CASE:

$$\frac{20,000 \text{ LB CARBON}}{35.6 \text{ LB/DAY ORGANICS}} = 562(.05) = 28 \text{ DAYS AT}$$

5-7% ORGANICS
PICK UP

42 gpm AT
WORST CASE

$$\frac{20,000 \text{ LB CARBON}}{83.3 \text{ LB/DAY}} = 240(.05) = 12 \text{ DAYS AT}$$

100 gpm AT
WORST CASE

FOR NORMAL OPERATION, AFTER FULL TREATMENT TRAIN, OR WITH BY-PASS:

50 gpm - 7 LB/DAY ORGANICS

$$\frac{20,000}{7} = 2857(.05) = 143 \text{ DAYS}$$

100 gpm - 7 LB/DAY + 35.6 LB/DAY = 42.6 LB/DAY

$$\frac{20,000}{47.1} = 470(.05) = 24 \text{ DAYS}$$



ENCOTECH

Activated Carbon Products & Systems

August 19, 1992

TreaTek-CRA
7703 Niagara Falls Blvd.
Niagara Falls, NY 14304

Attn: Mr. Bill Delnicki

Subject: Activated Carbon Adsorption Equipment

Dear Mr. Delnicki:

Thank you for the opportunity to offer TreaTek-CRA this proposal for activated carbon adsorption equipment. The following describes the equipment we discussed by telephone.

(A.) Vapor Phase Activated Carbon Adsorbers.

- (1.) 1,000# GAC Capacity Unit (GP-1000) \$ 5,500.00 ea.
- (2.) 2,000# GAC Capacity Unit (GP-2000) ... \$ 6,800.00 ea.

Attached are drawings which provide more information on these adsorbers.

(B.) Liquid Phase Adsorption System.

The following is a description of a One(1) Train x Two(2) Stage system using 20,000# GAC capacity adsorbers.

- (1.) Two (2)-10' diameter X 10' straightside, 75 psig ASME coded, lined carbon steel adsorbers with flanged and dished top and bottom heads, each capable of containing 20,000# of activated carbon.
- (2.) Each adsorber will be sand blasted and lined with Plasite 4310, a vinyl ester lining with excellent chemical and abrasion resistance.
- (3.) The underdrain for each adsorber will be constructed from 1" diameter 316 stainless steel laterals manifolded into a 3" diameter 316 stainless steel header supported on 316 stainless steel septums.

- (4.) The distributors will be fabricated from 3" diameter 316 stainless steel pipe with appropriate fittings.
- (5.) All process face piping and fittings including backwash inlet and outlet, vent and pressure relief lines will be 3" diameter Sch 40 carbon steel. The process valves will be 3" diameter butterfly valves.
- (6.) Both the spent carbon discharge and replacement carbon fill lines will be 4" diameter Sch 40 carbon steel pipe with 4" diameter 316 stainless steel full port ball valves.
- (7.) Associated appurtenances such as sample ports, pressure gages, pressure relief valves and vacuum breaker required to operate the adsorbers downflow, either individually, parallel or staged in series.
- (8.) The exterior of the adsorbers including the skids will be epoxy painted to your color specifications.
- (9.) 40,000# (20,000# per adsorber) of an 8 x 30 mesh virgin granular activated carbon as the initial fill.

Attached are additional drawings which provide additional information.

The budgetary cost for this activated carbon system will be \$130,000.00. This price does not include any costs for Local, State or Federal taxes or permits. Final cost of the system can be offered when the exact nature and requirements of the system are finalized.

Also, the above budgetary price for the system includes:

- (1.) Installation supervision and start-up assistance for the activated carbon system.
- (2.) Placement of the initial fill of activated carbon.
- (3.) Training of the treatment plant operators.
- (4.) Engineering drawings and operating manuals.

In order to complete this project, TreaTek or your customer, would be responsible for the following items:

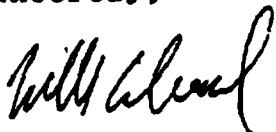
- (1.) A suitable construction site.

Treatek-CRA
Page 3

- (2.) A pump as the motive force for the influent to the activated carbon adsorbers.
- (3.) Connection of the influent, effluent, compressed air, backwash water inlet and outlet lines to and from the battery limits of the activated carbon adsorption system.
- (4.) Winterization, if required.
- (5.) Off-site reactivation of the spent carbon, as required. (Please keep in mind that at the appropriate time Encotech can offer a complete custom reactivation package for handling the spent carbon.)

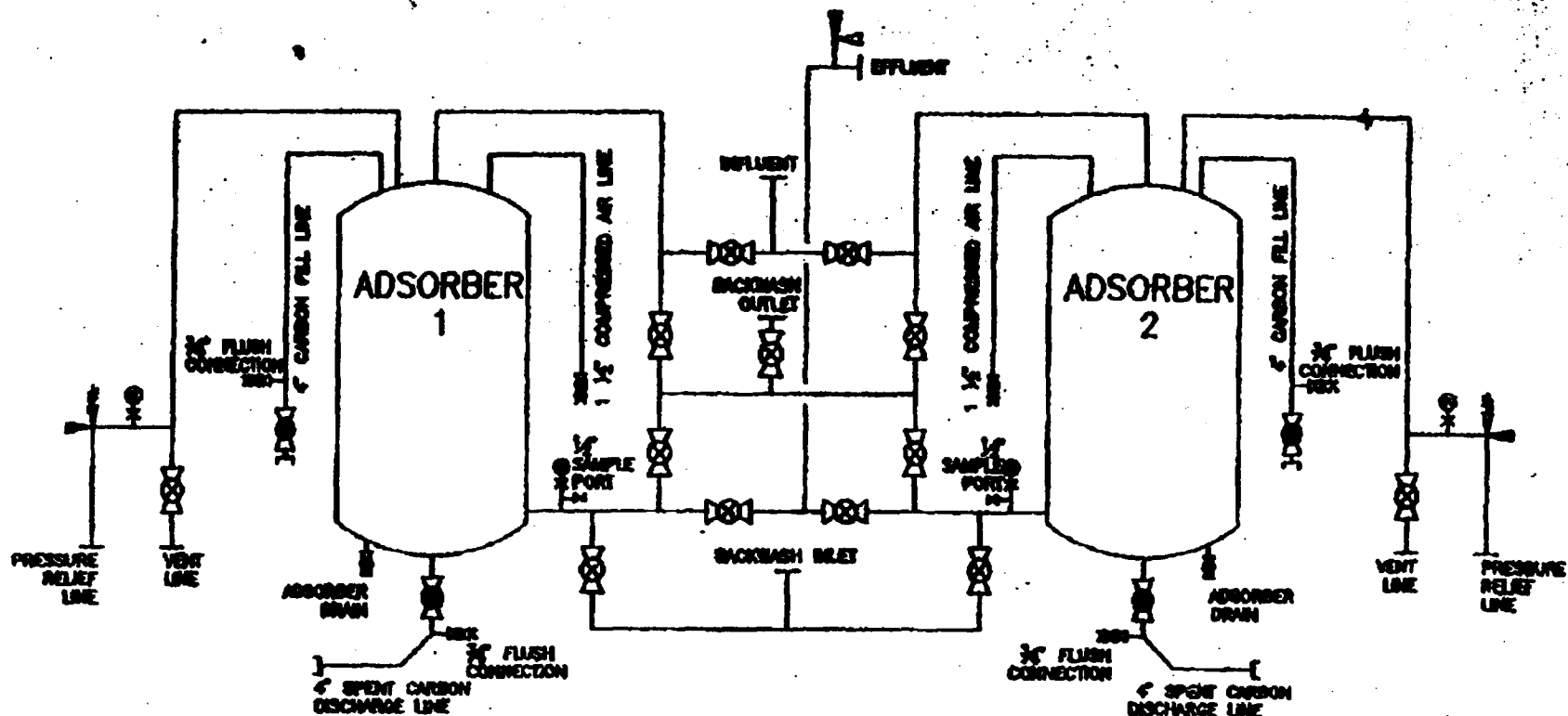
I trust this information is sufficient for your present purposes. However, please contact me if you have any questions or require additional information.

Sincerely,



William Copeland
Activated Carbon Systems

encl.

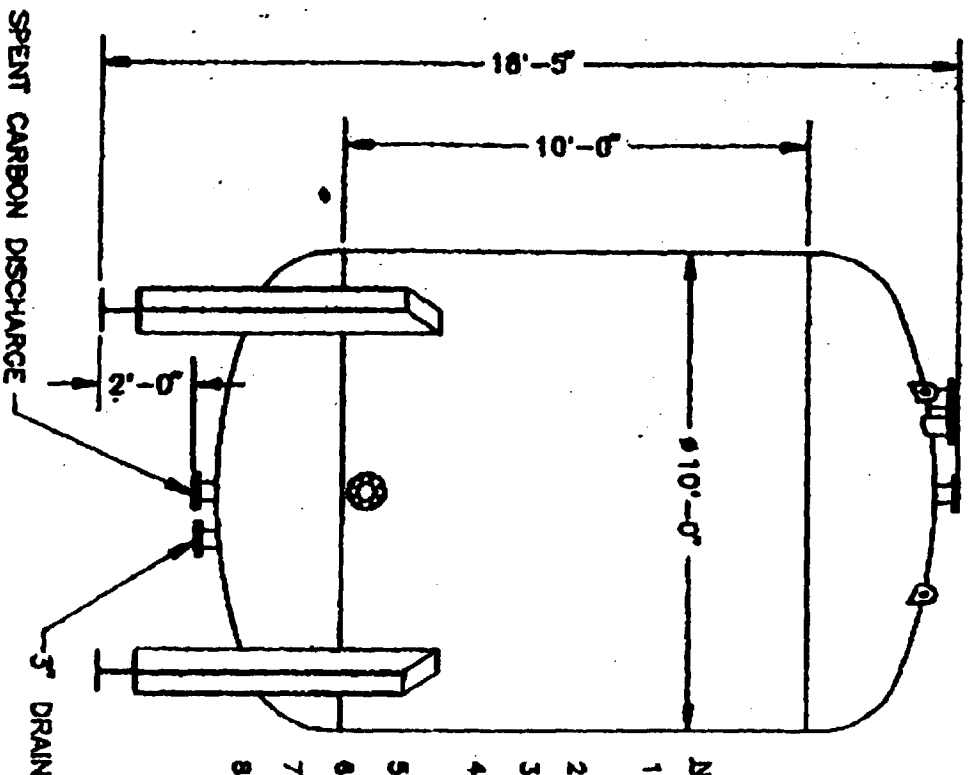
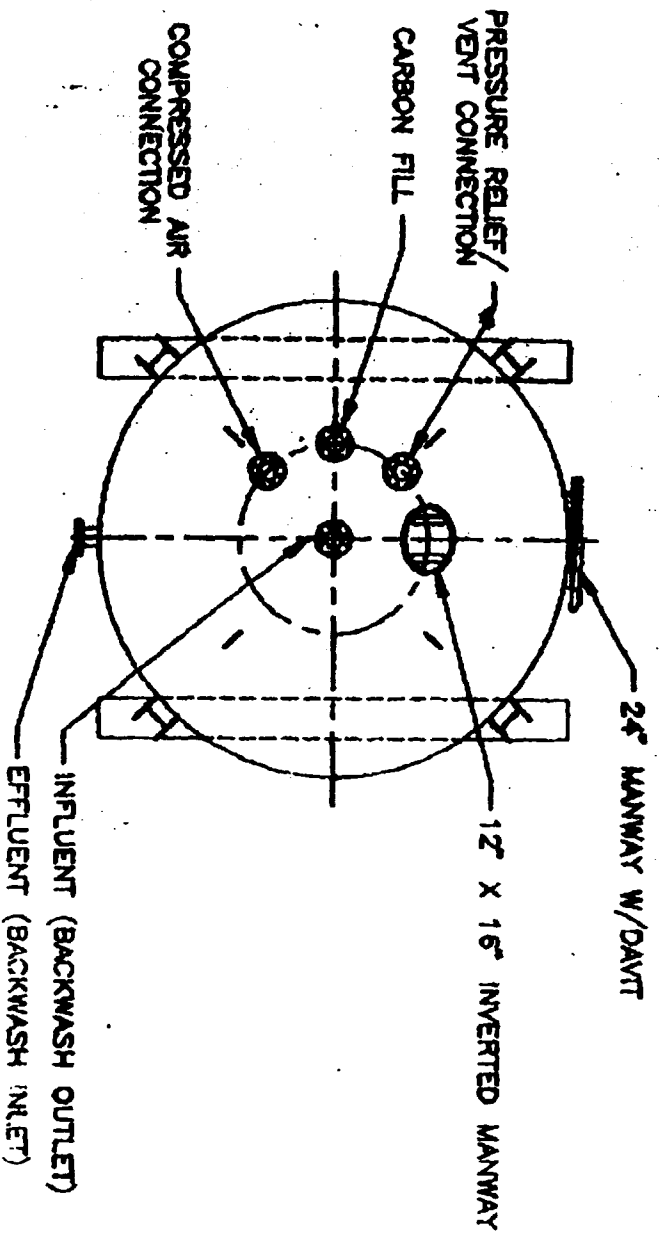


LEGEND

	CARBON TRANSFER VALVE
	PROCESS VALVE
	UTILITY VALVE
	PRESSURE GAGE WITH GAGE COCK
	PRESSURE RELIEF
	VACUUM BREAKER
	QUICK CONNECT
	CUSTOMER CONNECTION POINT

NOTE: ALL PIPING 3" SCH 40 CARBON STEEL UNLESS NOTED OTHERWISE

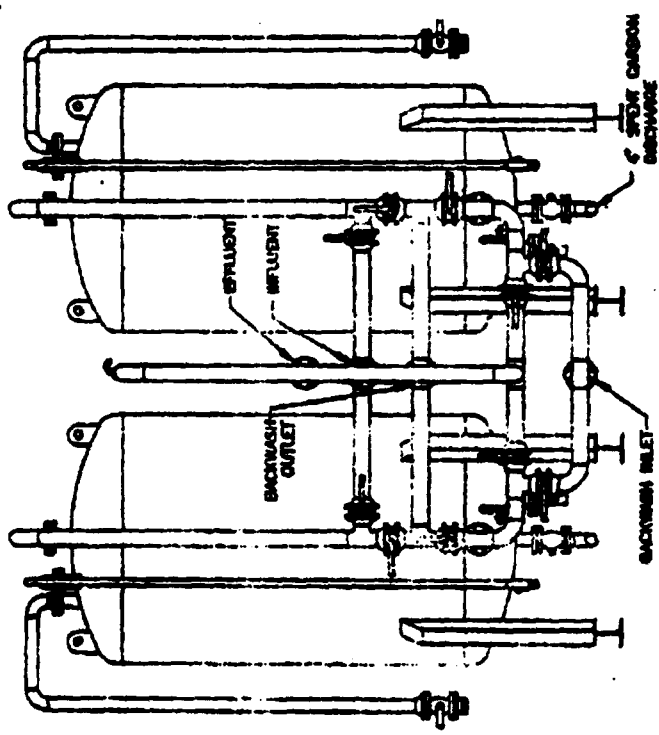
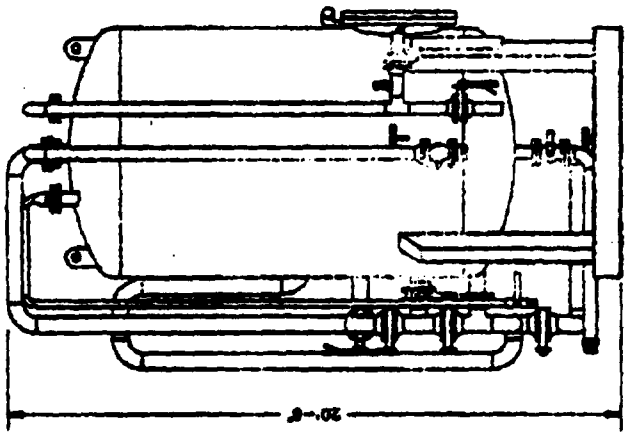
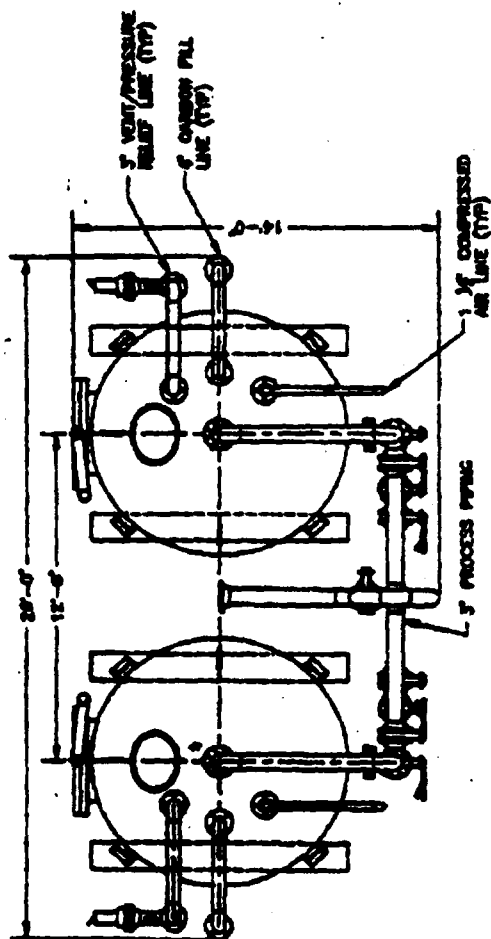
DATE CEN 8/18/92			
DESIGNED BY	1 TRAIN X 2 STAGE ACTIVATED CARBON ABSORPTION SYSTEM FLOW DIAGRAM		
APPROVED BY	DATE	BY	CHK
	089	F	1



NOTES:

- 1) ALL FLANGES 4"-150# RF
UNLESS NOTED OTHERWISE
- 2) ALL FLANGES EXTEND 6" FROM VESSEL
- 3) FOUR (4) LIFTING LUGS ON TOP HEAD
- 4) ASME CODE PER SECTION VIII, DIVISION 1
DESIGN PRESSURE 75 PSIG @ 200° F
- 5) MATERIAL: SA 516-70 CARBON STEEL
- 6) ALL WELDS GRIND SMOOTH
- 7) INTERNAL LINING: PLASTE 43:0
- 8) EXTERIOR FINISH: BLAST, PRIME & PAINT

DATE 8/18/82			
DESIGNED BY [Signature]		ACTIVATED CARBON ADSORBER 20,000# CAPACITY	
SCALE 1/4" = 1'	DRAWING NO. 089215-A	SHEET NO. 1	TOTAL SHEETS 1



REV	DATE	BY	CHKD	APP'D	DESCRIPTION
1	8/1/82				1. TRUNK Y 2 STAGE ACTIVATED CARBON ADSORPTION SYSTEM
2					APPROVALS
3					089215-G 1-100

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-T10</u>
NAME	<u>SURGE TANK #3</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>Plas-Tanks Industries, Inc.</u> <u>5011 Factory Drive</u> <u>Fairfield, OH 45014</u> <u>513-829-8888</u>
DISTRIBUTOR	<u>K-Tech Assoc.</u> <u>1868 Niagara Falls Blvd., Suite 304</u> <u>Niagara Falls, NY 14150</u> <u>716-695-1038</u>
DESCRIPTION	<u>FRP-Vinyl Ester with single nexus veil</u> <u>Flat Bottom, Dished Top</u> <u>2000 gallon capacity</u> <u>6'OD, 10'SSH</u>
MAINTENANCE	<u>Inspect for leaks</u>
COMPONENT PARTS	
SPARE PARTS	

SURGE TANK #3

TANK TO PROVIDE ~750 GAL VOLUME OF WATER PRIOR TO DISCHARGE

HDPE TANK (SAME AS SURGE TANK #2)
5.3 ft dia x 7.75 ft H

$$\pi \left(\frac{5.3 \text{ ft}}{2} \right)^2 (7.75 \text{ ft}) \left(\frac{7.48 \text{ gal}}{\text{ft}^3} \right) = 1280 \text{ gal}$$

1100 gal OPERATING VOLUME

AT 50 GPM

$$\frac{750 \text{ gal}}{50 \text{ gpm}} = 15 \text{ min RETENTION TIME}$$

$$\frac{1100 \text{ gal}}{50 \text{ gpm}} = 22 \text{ min RETENTION TIME}$$

AT 100 GPM

$$\frac{750 \text{ gal}}{100 \text{ gpm}} = 7.5 \text{ min RETENTION TIME}$$

$$\frac{1100 \text{ gal}}{100 \text{ gpm}} = 11 \text{ min RETENTION TIME}$$

Vertical Bulk Storage Tanks

Nalgene Vertical Storage Tanks have a number of unique features. The entire line offers:

- Sizes ranging from 550 gallons to 12,500 gallons
- Seamless construction
- Leakproof design
- Mounting flats on the bottom portion of the tank
- Choice of two resins (XLPE, HDPE) and two specific gravities (1.5, 1.9)
- Tie-down lugs
- Translucent; observable liquid level; tanks up to 4000 gallons are gray (XLPE) or natural (HDPE); XLPE tanks larger than 4000 gallons are green

Features common to tanks from 550 to 4000 gallons include:

- Circular top head flat for fittings (excluding 550-gallon size)
- Molded-in calibrations
- Several manway options

Nalgene Vertical Storage Tanks have flat bottoms for easy installation. Smaller tanks (550-1550 gallons) incorporate narrow-diameter design for space-saving bulk storage. This makes them economical for in-plant use. Standard 16-in. lever-lock cover simplifies manway opening and closing.

Tanks are engineered for tough applications. They provide excellent low-temperature impact resistance and are UV stabilized for outdoor use.

Fittings and other accessories can be added as specified to meet your requirements. Options are found on pages 10-11.

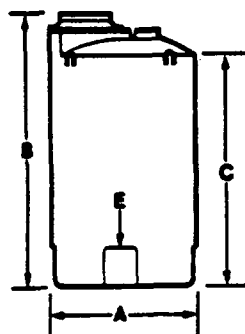
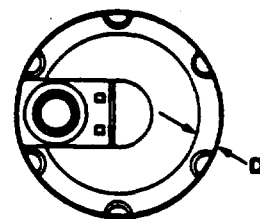
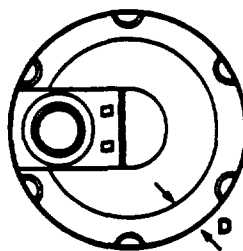
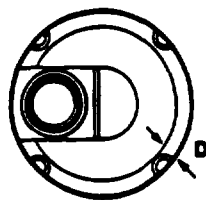
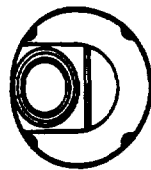
On request, Nalge Company will hydrostatically test your bulk storage tanks. Contact Nalge Industrial Department for details.

Note: All dimensions noted on tank drawings are nominal. Vertical tanks from 550 to 4000 gallons do not include fittings, which must be ordered separately. Tanks over 4000 gallons have one 2-in. standard PVC fitting

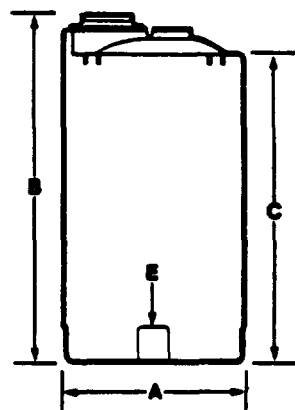
VERTICAL TANKS

Tank Size, Gallons	D x H, in.	Specific Gravity	Material		XLPE Wall Thickness,* inches	XLPE Approx. Weight, pounds	Standard Manway, inches
			XLPE Cat. No., Size Code	HDPE Cat. No., Size Code			
550	48 x 84	1.5	—	—	—	—	—
		1.9	51309-0550	51109-0550	.25	140	16
850	64 x 74	1.5	51305-0850	51105-0850	.25	150	16
		1.9	51309-0850	51109-0850	.28	170	16
1100	64 x 93	1.5	51305-1100	51105-1100	.31	190	16
		1.9	51309-1100	51109-1100	.37	220	16
1550	64 x 127	1.5	51305-1550	51105-1550	.34	280	16
		1.9	51309-1550	51109-1550	.41	415	16
2000	96 x 83	1.5	51305-2000	51105-2000	.31	320	16
		1.9	51309-2000	51109-2000	.44	445	16
2500	96 x 99	1.5	51305-2500	51105-2500	.38	430	16
		1.9	51309-2500	51109-2500	.50	625	16
3000	96 x 116	1.5	51305-3000	51105-3000	.44	620	21
		1.9	51309-3000	51109-3000	.56	800	21
3000 96-in. dia.	90 x 126	1.5	51305-3090	51105-3090	.44	620	21
		1.9	51309-3090	51109-3090	.56	800	21
4000	96 x 145	1.5	51305-4000	51105-4000	.56	850	21
		1.9	51309-4000	51109-4000	.81	1100	21
4000 96-in. dia.	90 x 162	1.5	51305-4090	51105-4090	.56	850	21
		1.9	51309-4090	51109-4090	.81	1100	21
5600	142 x 101	1.5	41305-5650	—	.44	950	18
		1.9	41309-5650	—	.57	1150	18
7000	142 x 120	1.5	41305-7050	—	.64	1060	18
		1.9	41309-7050	—	.81	1350	18
10,500	142 x 168	1.5	41305-9105	—	.82	2030	18
		1.7	41307-9105	—	.96	2180	18
12,500	142 x 197	1.5	41305-9125	—	.95	2700	18
		1.7	41307-9125	—	1.11	2900	18

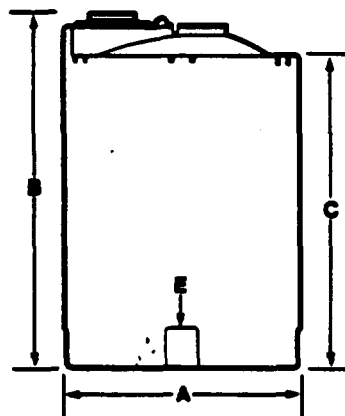
*Wall thickness based on bottom side wall.



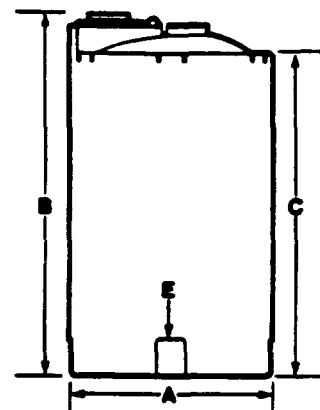
550-GAL. TANK



850-, 1100-, 1550-GAL. TANKS



2000-, 2500-, 3000-, 4000-GAL. TANKS

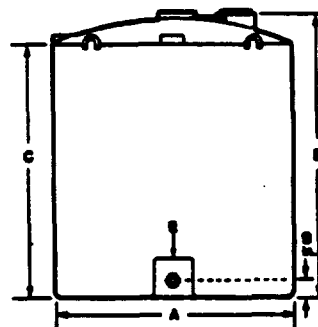
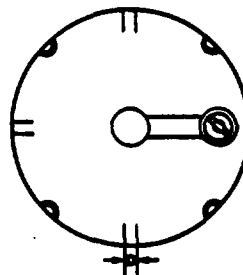


3000-, 4000-GAL. TANKS (90-in. DIA.)

VERTICAL TANKS

Tank Size, Gallons	A, in.	B, in.	C, in.	D, in.	E, in.	Standard Fittings No.	Size, in.
550	48	84	72	—	11 x 12	—	—
850	64	74	62	6	11 x 12	—	—
1100	64	93	79	6	11 x 12	—	—
1550	64	127	113	6	11 x 12	—	—
2000	96	83	66	12	13 x 16	—	—
2500	96	99	82	12	13 x 16	—	—
3000	96	116	98	12	13 x 16	—	—
3000 12 x 16	90	126	108	9	7 x 9	—	—
4000	96	145	128	12	13 x 16	—	—
4000 12 x 16	90	162	146	9	7 x 9	—	—
5600	142	101	86	15	12 x 12	1	2 HD*
7000	142	120	105	15	12 x 12	1	2 HD
10,500	142	168	153	15	12 x 28	1	2 HD
12,500	142	197	182	15	12 x 28	1	2 HD

*Heavy-duty PVC



5600-, 7000-, 10,500-, 12,500-GAL. TANKS

Note: When factory-installed fittings are required, you must provide us with the catalog number for each fitting, catalog number for each tank, and drawings (freehand is acceptable) of each tank with its fitting(s).



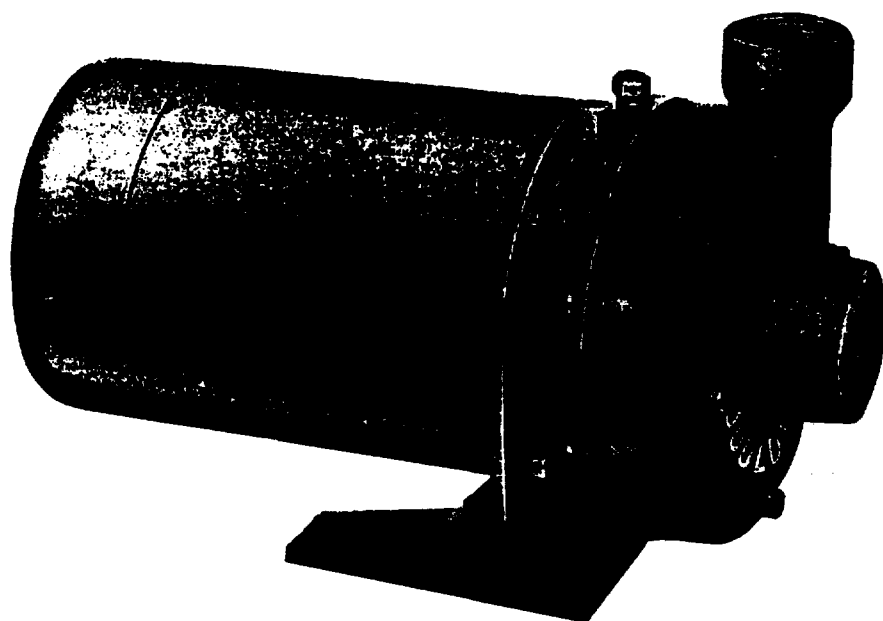
Call your distributor
to order these Nalgene Industrial Products.



EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-P15</u>
NAME	<u>BYPASS PUMP</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>GIL GOULDS PUMP</u> <u>PO Box 330</u> <u>SENECA FALLS, NY 13148</u> <u>315-568-2811</u>
DISTRIBUTOR	<u>PUMP & COMPRESSOR EQUIPMENT, INC</u> <u>570 Elk St</u> <u>BUFFALO, NY 14210</u> <u>716-823-1504</u>
DESCRIPTION	<u>CLOSE COUPLED CENTRIFUGAL PUMP</u> <u>MODEL 3642</u> <u>50 GPM AT 50' HEAD</u> <u>1 1/4 x 1 1/2 - 5, 3500 RPM, 1 1/2 HP, 230/460V</u> <u>3 PHASE</u>
MAINTENANCE	<u>INSPECT FOR LEAKS</u>
COMPONENT PARTS	
SPARE PARTS	



G & L Close-Coupled Centrifugal Pumps

MODEL

3642

APPLICATIONS

Specifically designed for the following uses:

- Water Circulation
- Booster Service
- Liquid Transfer
- Spraying Systems
- Jockey Pump Service
- General Purpose Pumping

SPECIFICATIONS

Pump:

- Capacities to 110 GPM
- Heads to 118 feet
- Pipe connections:

MODEL	SUCTION	DISCHARGE
1 x 1¼ - 5	1¼" NPT	1" NPT
1¼ x 1½ - 5	1½" NPT	1¼" NPT

- Maximum working pressure: 125 PSI
- Temperature: standard seal — 212°F, (100°C) maximum. Optional high temperature seal — 250°F, (121°C) maximum.
- Rotation: right hand i.e.; clockwise when viewed from motor end.

Motor:

- NEMA Standard
- Open drip proof, TEFC, or (Explosion proof three phase only) enclosures.
- 60 Hz, 3500 RPM
- Stainless steel shaft
- Single phase: 115/230 volt, ½-2 HP ODP, ½-2 HP TEFC. Built-in overload with automatic reset.
- Three phase: ½-2 HP: ODP, 208-230/460 volt ½-2 HP: TEFC, 208-230/460 volt ½-2 HP: expl. proof, 230/460 volt
- Overload protection must be provided in starter unit. Starter and heaters (3) must be ordered separately.

FEATURES

Compact Design: Close coupled space saving design provides for easy installation. Flexible couplings in bedplates not required.

Mounting: Can be mounted in vertical or horizontal position.

Construction: Available in bronze fitted (BF), all iron (AI), or all bronze (AB). Bronze fitted means bronze impeller.

Impeller: Enclosed design for high efficiencies. Threaded connection on motor shaft. Stainless steel locknut on three phase models. Requires no clearance adjustment. Balanced for smooth operation.

Casing: Volute type, cast iron or bronze construction. Back pullout design. Discharge can be rotated to eight positions. Vertical discharge standard. Tapped openings provided for priming, venting, and draining.

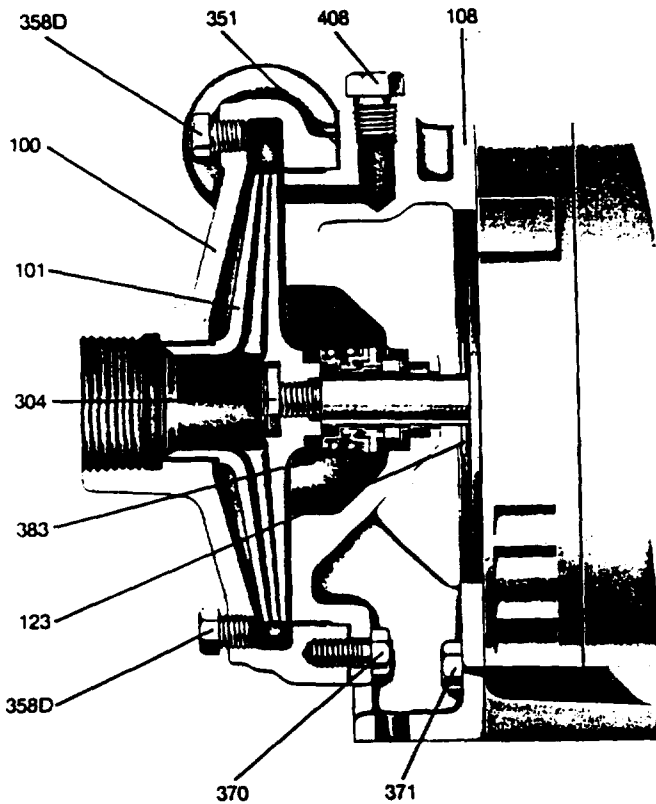
Mechanical Seal: Standard carbon/ceramic faces, Buna-N elastomers, 300 Series stainless steel components. Option seals available.

Motor: Close-coupled design. Ball bearings carry all radial and thrust loads. Designed for continuous operation. All ratings are within working limits of the motor.

G & L Close-Coupled Centrifugal Pumps

MODEL 

3642



PARTS

Item No.	Part Name	Material		
		Bronze Fitted	All Iron	All Bronze
100	Casing	1001	1001	1102
101	Impeller	1102	1001	1102
108	Adapter	1001	1001	1102
123	Water Deflector	Rubber or Micarta®		
304	Impeller Nut*	Stainless Steel		
351	Gasket-Casing	Composite		
358D	Pipe Plug 1/4" Vent and Drain	Steel	Steel	Brass
370	H. HD Cap Screw Adapter to Case	Steel		
371	H. HD Cap Screw Adapter to Motor	Steel		
383	Mechanical Seal			
	10K10 Std.	Service General	Rotary Stationary	Elastomers Metal Parts
			Ceramic	
	10K6	Heavy Duty		BUNA
	10K18 Opt.	Hi Temp.	Carbon Ni-Resist	EPR 18-8 S.S.
	10K24	Chem. Duty		Viton
408	Pipe Plug-Priming 1/4" NPT	Steel		Brass

* Impeller nut furnished on 3 phase units only.

MATERIALS OF CONSTRUCTION

Material Code	Engineering Standard
1001	Cast Iron ASTM A48 CL 20
1102	Bronze ASTM B584

MOTOR FRAME

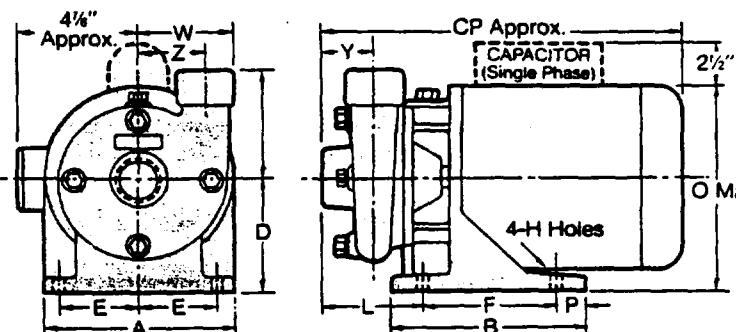
Motor Frame	1 Phase		3 Phase	
	ODP	TEFC	ODP	TEFC/EXPL
48	1/2	—	—	—
56	1/2-2	1/2-2	1/2-2	1/2-2

DIMENSIONS AND WEIGHTS

Pump	A	B	D	E	F	H	L	O	P	W	X	Y	Z	CP	Motor Frame	Weight (lbs.)
1 x 1 1/2-5							3 1/2	7				2 1/2	3 1/2	13 1/2	48	55
	6 1/2	5 1/2	4 1/2	2 1/2	5	1 1/2	7 1/2	1 1/2	4	4				15 1/2	56	67
1 1/2 x 1 1/2-5							3 1/2	7 1/2				2 1/2	3 1/2	15 1/2	56	68

(All dimensions in inches and weight in lbs.)

(Do not use for construction purposes.)

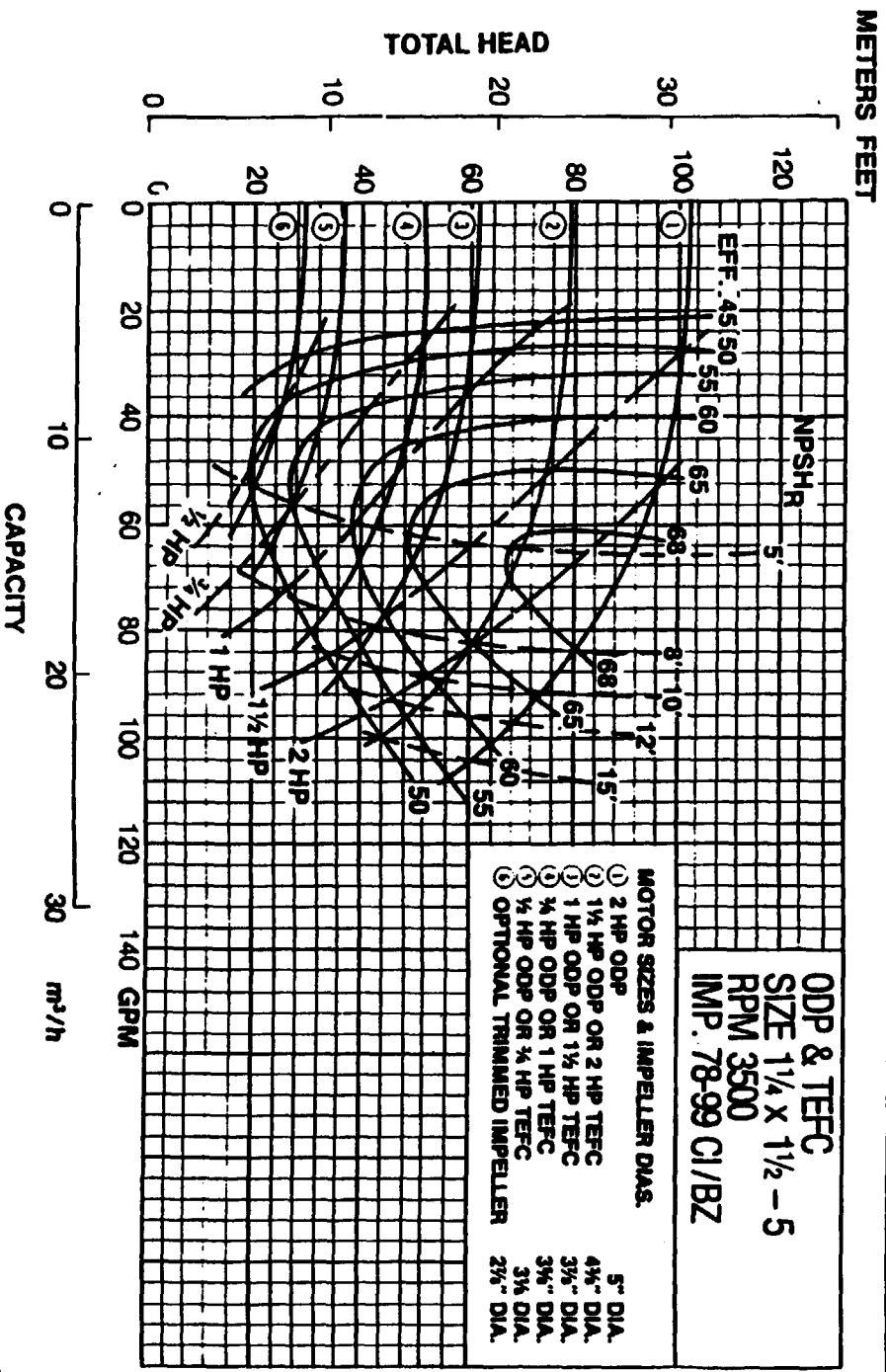
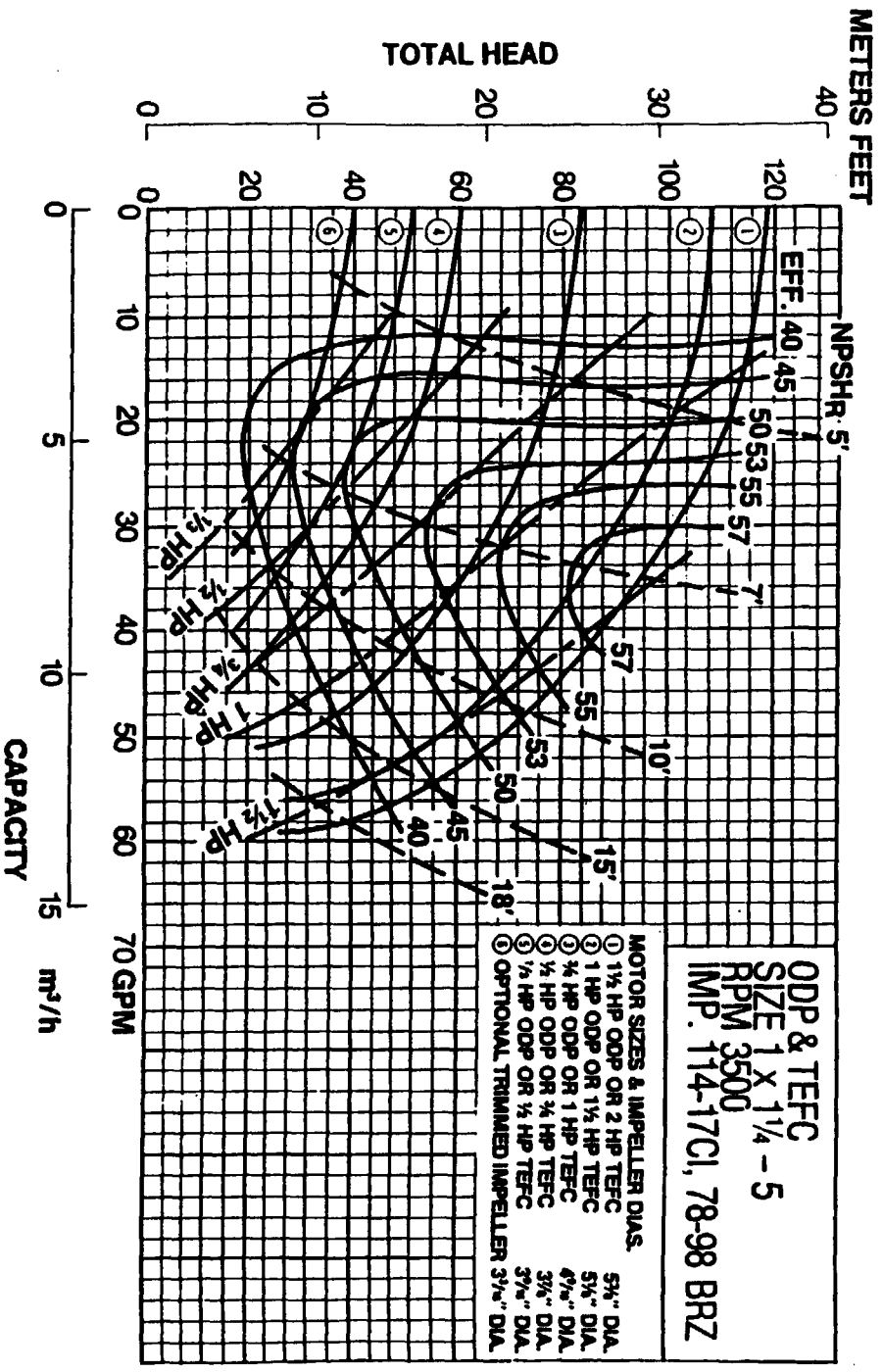


Close-Coupled Centrifugal Pumps

SECTION 1

MODEL

3642



EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-T9</u>
NAME	<u>SLUDGE HANDLING TANK</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>Nalgene Industrial Products Group</u> <u>Nalge Company, P.O. Box 20365</u> <u>Rochester, NY 14602</u> <u>716-586-8800</u>
DISTRIBUTOR	<u>Karus Equipment Company</u> <u>P.O. Box 631</u> <u>Buffalo, NY 14226</u> <u>716-839-1908</u>
DESCRIPTION	<u>4200 gallon capacity</u> <u>XLPE cone bottom, dished top</u> <u>96"OD, 137"SSH, 177"DAH</u> <u>Model 53309-4200 tank</u> <u>53009-4200 stand</u>
MAINTENANCE	<u>Inspect for leaks</u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>

Conical- Bottom Storage Tanks

Available in sizes from 1575 gallons to 7400 gallons, these tanks are durable, chemical-resistant, and ideal for applications requiring complete drainage. All sizes are available in XLPE and HDPE. Tank features include:

- Seamless, one-piece construction — 1.9 specific gravity
- UV inhibitor for sunlight protection
- Observable liquid level (translucent)
- Molded-in tie-down lugs
- Rugged steel stand with chemical-resistant coating
- Molded-in calibrations on most sizes

The 6000- and 7400-gallon tanks come with a 2-in. heavy-duty PVC bulkhead fitting with EPDM gasket in cone bottom, and an 18-in. offset threaded manway (15-in. opening) with 5-in. center fill (2 vents), as standard equipment. No splash guards are provided on tanks from 1575 to 4200 gallons.

See pages 10-11 for options, including PVC or PP bulkhead fittings, Viton gaskets, U-vents, and flange adapters.

NOTE: Tanks and stands must be ordered individually.

CONICAL-BOTTOM TANKS

Tank Size, Gallons	D x H, in.	Specific Gravity	Material		XLPE Wall Thickness,* inches	XLPE Approx. Weight, pounds
			XLPE Cat. No., Size Code	HDPE Cat. No., Size Code		
1575	86 x 103	1.9	53309-1575	53109-1575	.50	450
1950	96 x 110	1.9	53309-1950	53109-1950	.48	480
2200	96 x 105	1.9	53309-2200	53109-2200	.56	600
2600	86 x 145	1.9	53309-2600	53109-2600	.57	700
3000	90 x 140	1.9	53309-3000	53109-3000	.56	825
4200	96 x 163	1.9	53309-4200	53109-4200	.88	1100
6000	142 x 105	1.9	43309-6050	43109-6050	.53	1080
7400	142 x 128	1.9	43309-7050	43109-7050	.65	1500

*Wall thickness based on bottom side wall.

CONICAL-BOTTOM STANDS

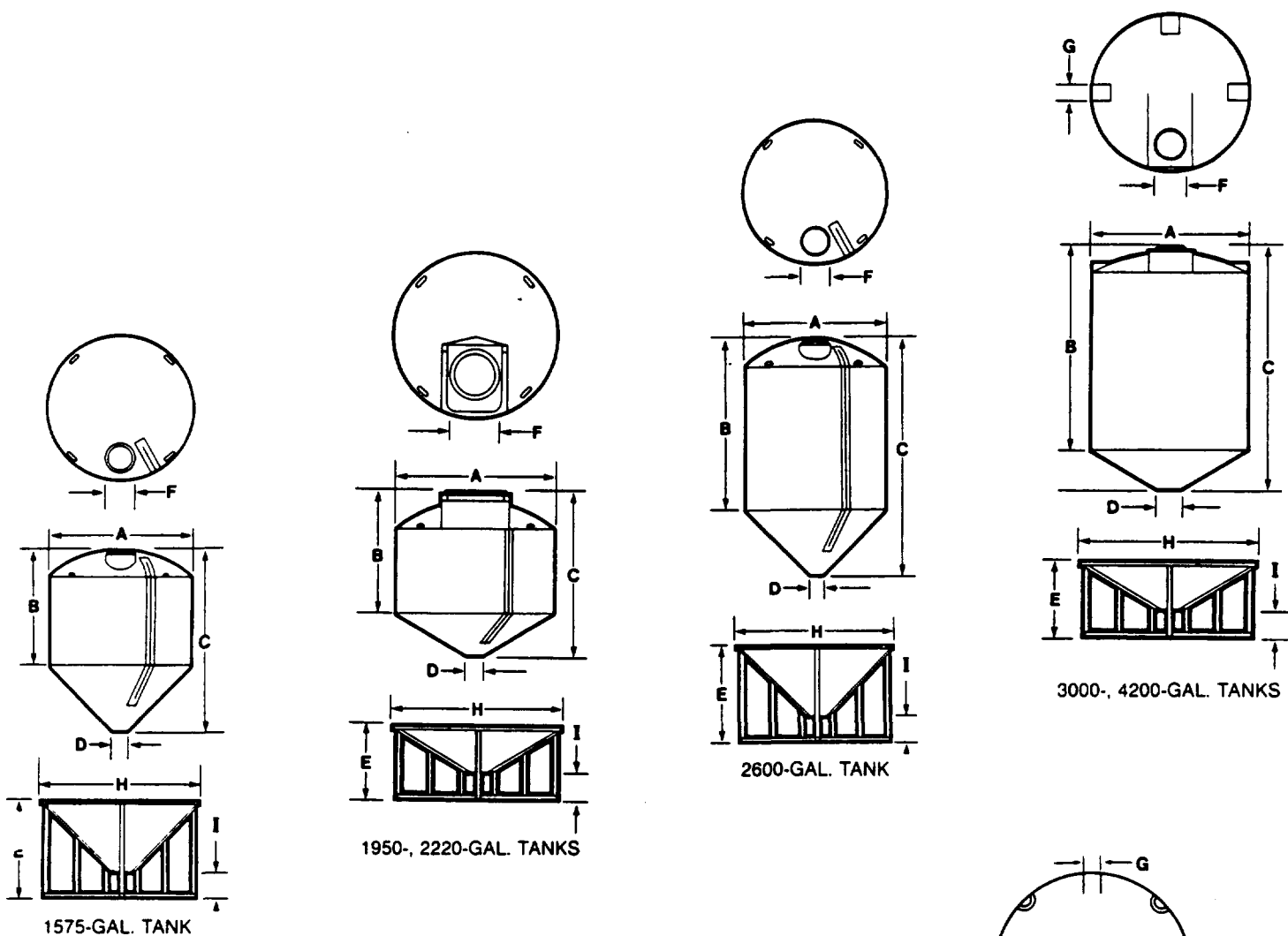
Tank Size, Gallons	Cat. No., Size Code	Approx. Weight, pounds	Cone Angle
1575	53009-1575	440	45°
1950	53009-1950	400	30°
2200	53009-2200	400	30°
2600	53009-2600	440	45°
3000	53009-3000	400	30°
4200	53009-4200	400	30°
6000	43009-6050*	1250	30°
7400	43009-7450*	1250	30°

*Includes FRP splash guard



Call your distributor
to order these Nalgene Industrial Products.

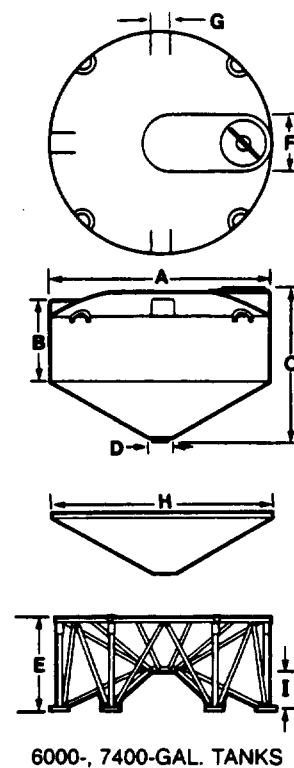




CONICAL-BOTTOM TANKS AND STANDS

Tank Size, Gallons	A, in.	B, in.	C, in.	D, in.	E, in.	F, in.	G, in.	H, in.	I, in.
1575	86	60	103	9	53	16	—	86	14
1950	96	66	110	8	40	24	—	96	14
2200	96	74	105	8	40	24	—	97	14
2600	86	99	145	9	53	16	—	86	14
3000	90	117	140	8	38	21	10	90	14
4200	96	137	163	8	40	21	10	97	14
6000	142	88	128	14	61	18†	15	145	25
7400	142	105	144	14	61	18†	15	145	25

†15-in. opening



NOTE: Bolted construction for field assembly. (6000- and 7400-sizes only)

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-P13</u>
NAME	<u>SLUDGE DEWATERING PUMP</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>Moyno</u>
DISTRIBUTOR	<u>Resi-Tech Inc.</u>
	<u>7927 US Highway 24</u>
	<u>Manhattan, KS 66502</u>
	<u>913-776-8383</u>
DESCRIPTION	<u>Moyno Progressive Cavity Pump</u>
	<u>Model 367</u>
	<u>Part of sludge dewatering system</u>
MAINTENANCE	
COMPONENT PARTS	
SPARE PARTS	

SOLIDS Dewatering

SYSTEM SIZED TO HANDLE 2 GPM STREAM ON A CONTINUOUS BASIS WITH APPROXIMATELY 250-400 LBS OF SOLIDS TO Dewater. BASED ON OUR SPECIFICATIONS THE UNIT RECOMMENDED IS THE DRAIMAD MODEL 6BCA

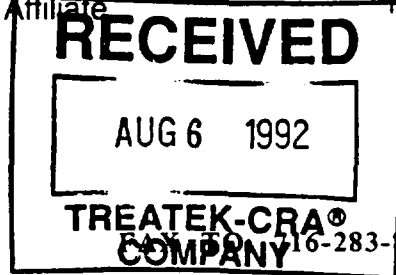
THIS UNIT HAS 6 BAGS, 3 CUFT IN VOLUME EACH. THIS SYSTEM WOULD OPERATE 20 DAYS/MONTH USING 121 BAGS/MONTH.

THE BAG WILL INITIALLY BE 30% SOLIDS CONCENTRATION, AFTER FURTHER DRAINING SOLIDS CONCENTRATION WILL BE 60% SOLIDS

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-X6</u>
NAME	<u>SOLIDS DEWATERING</u>
LOCATION	<u>TREATMENT BUILDING</u>
DISTRIBUTOR	<u>Resi-Tech Inc.</u> <u>7927 US Highway 24</u> <u>Manhattan, KS 66502</u> <u>913-776-8383</u>
DISTRIBUTOR	<u>I. Andrew Lange, Inc.</u> <u>4455 Genesee Street</u> <u>Syracuse, NY</u> <u>716-839-2225</u>
DESCRIPTION	<u>Model 6 BCA</u> <u>6 bag dewatering system</u> <u>9'W, 12'L, 6'H</u> <u>includes pump (P13) and polymer addition system</u>
MAINTENANCE	<u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u>Drainad dewatering bags</u> <u>Bag wire ties</u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u>



FAX TRANSMITTAL

FAX NUMBER (913) 537-0813

DATE: August 3, 1992

PAGES:

TO: TreaTek-CRA
Attn: Mr. Bill Deinickl
FROM: Lawrence A. Schmid, President
SUBJECT: Sludge Dewatering from Ground Water Treatment

We have reviewed your request for information and are pleased to provide you with a formal quotation and proposal on a dewatering system which we feel would perform excellently in your application.

This system, which we call the DRAIMAD, is a novel dewatering system of ultimate simplicity. Sludge is injected with polymer and pumped into a stainless steel hood from which are hung porous bags. The water drains from the bags into a collection trough and the bags retain the sludge. The system automatically keeps topping off the bags until they are full and then shuts itself down. After 6 to 24 hours of gravity draining, the bags are removed with a supplied cart and put into containers, on pallets, or dumped into piles. The bagged sludge can be taken to a landfill at this point or stored on site for further natural drying.

Although only recently marketed within the U.S., the DRAIMAD has several thousand successful installations in Europe. Its primary usage has been with difficult to dewater industrial type sludges. By common purchase with my European counterpart, we have a reliable and economical supply of bags due to the large purchase volume per year. The bags are UPS shippable in lots of 100 for \$3 per bag plus freight. We stock them and can ship them out the same day.

An attached calculation sheet projects the dewatering needs for the 350 pounds per day of generated sludge. We would recommend a six bag machine. This would have a total projected operating cost of \$425 per month, including bags and polymer. The unit would occupy a floor area of 3' by 8'. Access would be required on each side of the unit for bag removal. This would make the overall area, including access space on the sides and at least one end of 9' by 12'.

The unit quoted includes the DRAIMAD unit and a pump and polymer makeup system. The latter is mounted on a 2' by 2' aluminum stand. The pump is a progressive cavity Moyno pump, Model 367. This may substitute for your air pump. If you want the latter, we can tie the controls into it and give a price adjustment. The pump is belt driven to deliver approximately 15 gpm of sludge. A 90 gallon polyethylene tank is provided for either dry or liquid polymer makeup. One tank should be sufficient for several days of operation. The tank includes a reduced speed propeller stirrer, an enclosed static polymer/sludge blending pipe system, a polymer injection pump, and all controls. The makeup station, called our Model IBF-100, plugs into a 115-V, receptacle with a dedicated 20 amp service. This provides power to the IBF-100 control panel which powers the mixer, pump, and polymer feed unit. The DRAIMAD control panel plugs into the control panel of the IBF-100, and controls all functions of the system.

The DRAIMAD certainly meets your requirements of "The system should be easy to operate and easy to maintain. Operator contact with the streams and the solids should be minimal." The DRAIMAD is of stainless steel and is easily cleaned. It has no moving parts other than the IBF-100. The operator never comes in contact with the sludge. The drainage water is captured in a stainless steel pan below the bags and directed to the sump or sewer.

The unit can be operated automatically with safety. The control panel has several features which allows setting of timed goals. If the bags do not fill to the level electrode within the set time, (such as with no sludge, a plugged pump, bag failure, etc.) the system shuts down. If it doesn't refill in the set time, it shuts down. When the bags are full as described by a timer, the system shuts down the pumps, polymer feed, and all controls. It then rests until the operator returns to remove the bags. The operator can install the bags, check the sludge, push the button and leave the unit for the rest of the day with confidence. No other system that I am aware of can offer this reliability.

For your quantity of sludge we are projecting a once per day operation for five days per week. This has the advantage of removing the sludge as it is produced and reducing the liquid sludge holding requirements.

The bags are non-woven porous fiber and do not have a set porosity. Experience to date has drainage water consistently less than 20 mg/l. You do not have the bleed through of belts or other dewatering units and you do not require any wash water. The system is not as demanding as others because if the polymer is not just right or the sludge changes, it just takes a little longer for the bags to drain. It will still work. Other systems require precise dosage and monitoring.

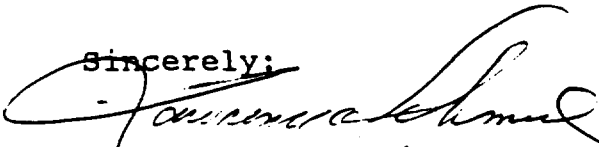
Page 3

Your sludge should not be difficult to dewater with polymers. These appear to be like conventional water treatment solids and there are many available for this. I do not see that as a problem and these polymers can be field optimized and selected once sludge is generated.

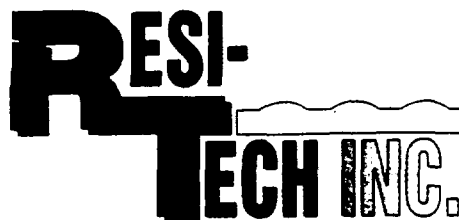
Our attached quotation is for a delivered total price of \$20,250 for a complete system. It will be shipped common carrier and can be unpacked and installed in under an hour. It requires a 115-V service, a water hose supply for polymer makeup, a 2" sludge connection line, and a 3" drain line. It is a complete package with all accessories and a starter supply of bags.

I hope you will give this your serious consideration. Your sludge production quantities are certainly in the range for the DRAIMAD application. If you have any questions over this proposal, please feel free to give me a call. I am putting a hard copy of this same material in an envelope by mail. I am also enclosing a test bag so you can see the porosity and toughness of the material. The full size bag will hold 3 cf of dewatered sludge.

Sincerely;



Lawrence A. Schmid, Ph.D., P.E.
President, RESI-TECH Inc.



Residual Technologies

An AERO-MOD Affiliate

Manhattan, Kansas

DRAIMAD PROPOSAL

DATE: 03-Aug-92
CLIENT: TreaTek-CRA
LOCATION: Niagara Falls, NY
APPLICATION: Alliance, Ohio Superfund Site

QTY	DESCRIPTION
1	DRAIMAD Model 6BCA, 6 bag unit
1	Bag Handling Trolley
1500	Bag wire ties
1	Bag tying tool
1	Polymer and feed pump system, IBF-100
	90 gallon polyethylene tank
	1/6 Hp Gear reduced mixer and impeller
	1.5 HP, 115V motor
	Flo-Jet polymer feed pump
	Moyno Model 367 Progressive cavity pump
	Automatic control panel
200	DRAIMAD dewatering bags

TOTAL PRICE, FREIGHT ALLOWED JOBSITE \$20,250.00

**PROJECTED DEWATERING AND DISPOSAL COSTS USING
THE DRAIMAD BAG DEWATERING SYSTEM**

CLIENT : Treatak - CRA - Superfund Site

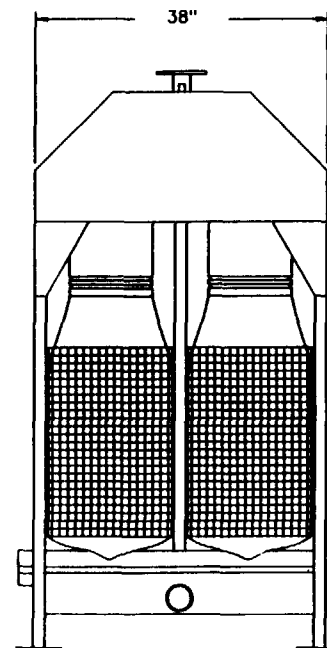
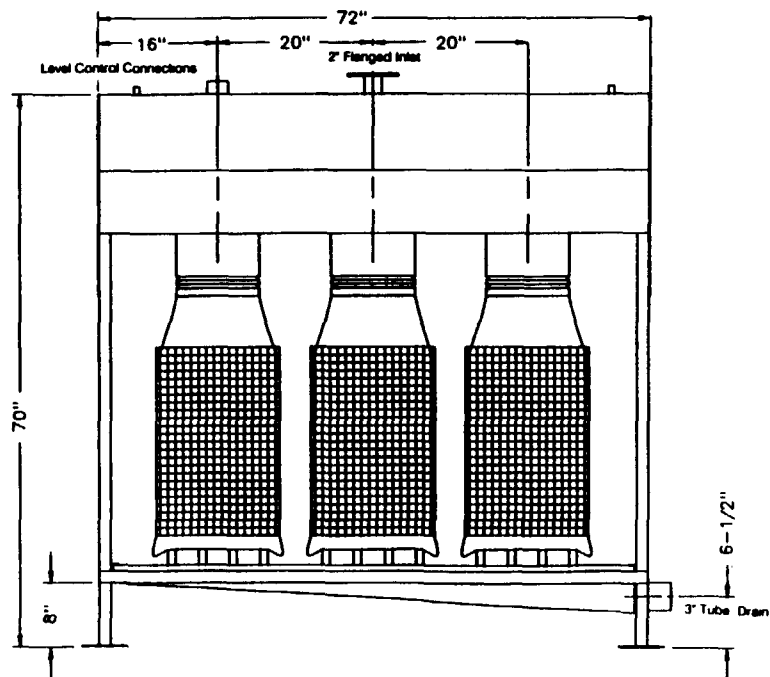
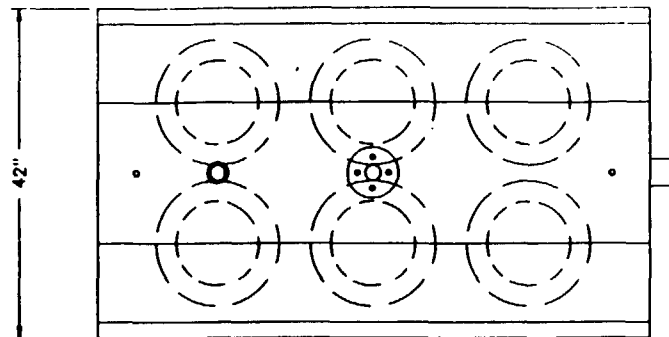
DATE: 21-Oct-92

Gallons of sludge per day	3350	
Solids concentration of sludge, mg/l	3,850	
Solids concentration of sludge in percent	0.39%	
Solids to dewater, dry pounds/day	172	
Polymer requirement, lbs/1000 lbs dry sludge	2.00	
Polymer cost per pound	\$3.00	
Bagged solids concentration, 1 day % solids	30.00%	
Pounds of dry solids per bag		86.5
Bagged solids concentration, 120 days % solids	60.00%	
Weight of bag, moisture, and solids, 120 days		144.2
Unit Model Number	6BCA	
Quantity	1	
Total Number of Bags Capacity	6	
Capacity of selected system, lbs/day dry solids	519	
Operational Days required/month	10	

COST ANALYSIS OF THE DRAIMAD

1) DEWATERING COSTS

Polymer requirement, lbs/month	10	
Polymer cost per month		\$31
Bags required per month	60	
Bag cost per month		\$179
Electrical cost per month @ \$0.07/KWH		\$3
		=====
Net sludge dewatering costs per month		\$213
Equivalent cost per gallon dewatered	\$0.002	

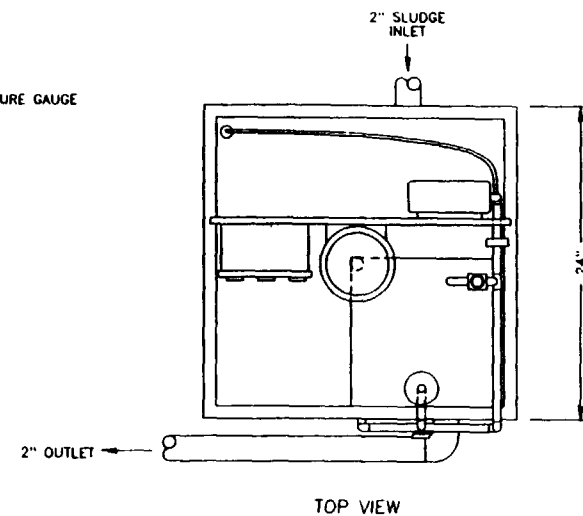
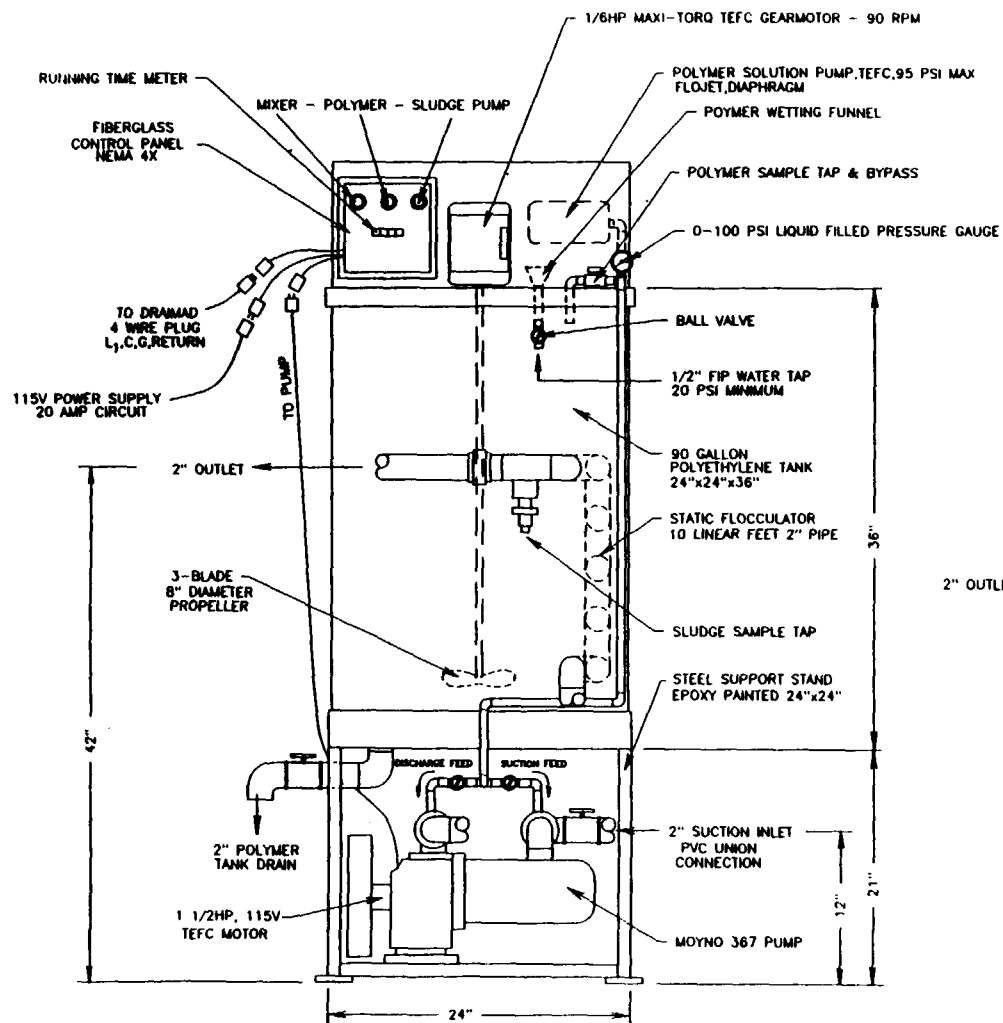


DRAIMAD UNIT -- MODEL 6 BCA



Aero-Mod Inc.
Wastewater Treatment Systems

5000 COACHMEN ROAD MANHATTAN KANSAS



**POLYMER MAKEUP UNIT
MODEL IBF-100**



Aero-Mod Inc.

Wastewater Treatment Systems

5000 COACHMEN ROAD MANHATTAN KANSAS

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-P14</u>
NAME	<u>SUMP PUMP</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>G & L GOULDS PUMPS</u> <u>PO BOX 330</u> <u>SENECA FALLS, NY 13148</u> <u>315-568-2811</u>
DISTRIBUTOR	<u>PUMP & COMPRESSOR EQUIPMENT, INC</u> <u>570 ELM ST</u> <u>BUFFALO, NY 14210</u> <u>716-823-1504</u>
DESCRIPTION	<u>CLOSE COUPLED SELF PRIMING PUMP</u> <u>MODEL XSH 07</u> <u>23 GPM AT 25' HEAD</u> <u>1 1/4" x 1 1/2" 3500 RPM, 3/4 HP, 115/230V</u>
MAINTENANCE	<u> </u> <u> </u> <u> </u> <u> </u> <u> </u>
COMPONENT PARTS	<u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u>
SPARE PARTS	<u> </u> <u> </u> <u> </u> <u> </u> <u> </u> <u> </u>

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO. SS2-T11

NAME SUMP

LOCATION TREATMENT BUILDING

MANUFACTURER

DISTRIBUTOR

DESCRIPTION

MAINTENANCE

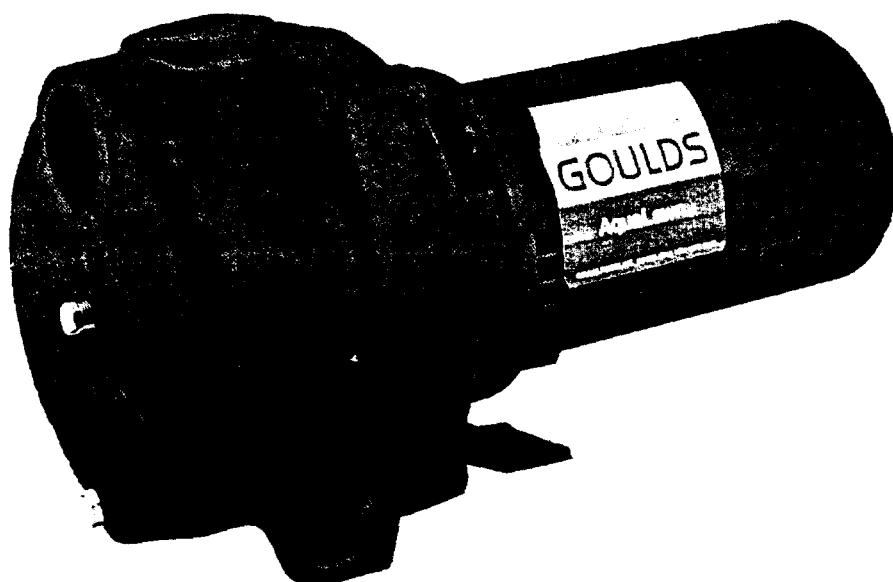
COMPONENT PARTS

SPARE PARTS

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-P14</u>
NAME	<u>SUMP PUMP</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>G & L GOULDS PUMPS</u> <u>PO BOX 330</u> <u>SENECA FALLS, NY 13148</u> <u>315-568-2811</u>
DISTRIBUTOR	<u>PUMP & COMPRESSOR EQUIPMENT, INC</u> <u>590 ECK ST</u> <u>BUFFALO, NY 14210</u> <u>716-823-1504</u>
DESCRIPTION	<u>CLOSE COUPLED SELF PRIMING PUMP</u> <u>MODEL XSH 07</u> <u>23 GPM AT 25' HEAD</u> <u>1 1/4 - 1 1/2, 3500 RPM, 3/4 HP, 115/230V</u>
MAINTENANCE	
COMPONENT PARTS	
SPARE PARTS	



Goulds Close-Coupled Self-Priming

MODEL



XSH

APPLICATIONS

Specifically designed for the following uses:

- Lawn Sprinkling
- Irrigation
- Air Conditioning Systems
- Heat Pumps
- Water Transfer

SPECIFICATIONS

Pump:

- Capacities to 114 GPM
- Heads to 127 feet
- Reprime capabilities to 25' suction lift.
- Pipe Connections:

MODEL	SUCTION	DISCHARGE
XSH07	1½"	1½"
XSH10		
XSH15		
XSH20	2"	2"
XSH30		

- Temperature: 160°F, (71°C) maximum.

Rotation: Right hand ie; clockwise when viewed from motor end.

Motor:

- NEMA Standard, Open Drip Proof
- 60Hz, 3500 RPM
- Stainless Steel Shaft
- Single Phase: ¾-2 HP, 115/230 V, 3 HP, 230 Volt only. Built-in overload with Automatic Reset.

- Capacitor Type

- Three Phase: 2 and 3 HP, 230/460 Volt.

Overload protection must be provided in starter unit.

Starter and Heaters (3) must be ordered separately.

- **Mechanical Seal:** Carbon/ceramic faces, BUNA elastomers, 300 Series stainless steel metal parts. Exclusive casing design prevents the seal from running dry.

- **Motor:** Designed for continuous operation. All ratings are within the working limits of the motor.

- **Corrosion-Resistant Coating:** Electro-coat paint process applied inside and out, and baked on.

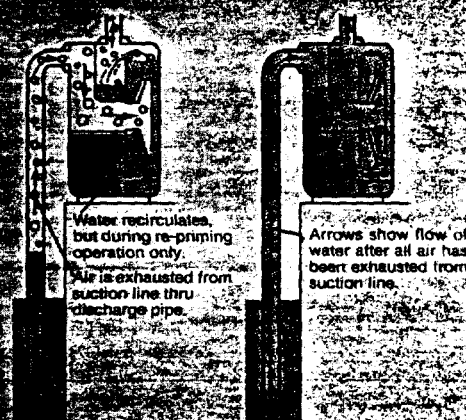
SELF-PRIMING

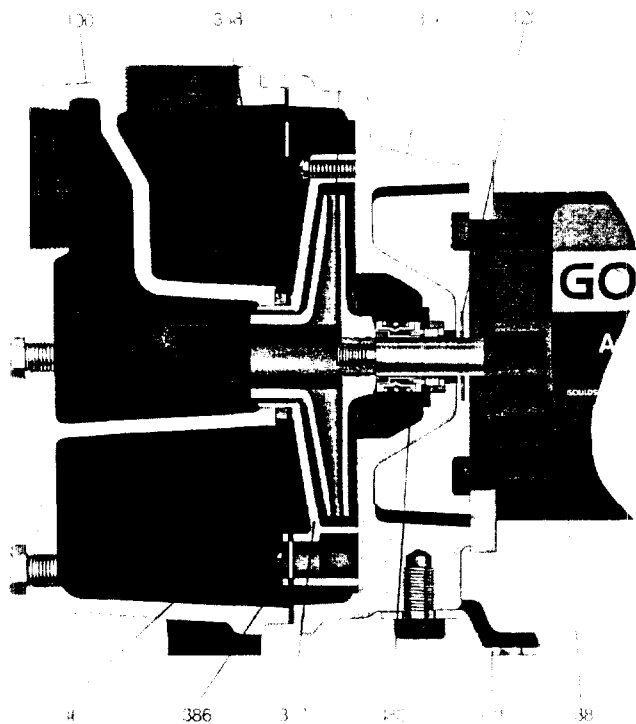
FEATURES

- **Self-Priming Design:** Water is retained in the casing while the pump dispels air. Once primed, this pump stays primed.

Impeller: 20% glass filled thermoplastic (Noryl®) on ¾-2 HP Models. Bronze impeller on 3 HP Models. Enclosed design for high efficiencies. Threaded directly on motor shaft.

- **Casings:** Cast iron construction. 4 bolt, back pull out design. Tapped openings provided for vacuum gauge and casing drain.





Goulds Close-Coupled Self-Priming

MODEL

XSH

PARTS

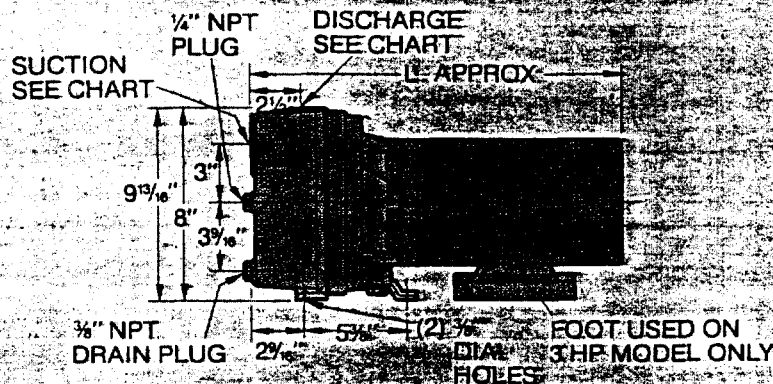
PERFORMANCE RATINGS (in gallons per minute)

Item No.	Part Name	Model No.	XSH07			XSH10			XSH15			XSH20			XSH30			
		HP	¾			1			1½			2			3			
100	Casing	Discharge Pressure PSI	20	30	40	20	30	40	20	30	40	20	30	40	20	30	40	
101	Impeller																	
120	Deflector																	
131	Pump Foot																	
146	Diaphragm (Except 3 HP)																	
304	Impeller Nut — Three Phase Only (Not Shown)	Suction Lift in Feet	10	39	30	11	47	39	27	57	54	34	73	71	57	89	75	58
314	Motor Adapter		15	34	27	0	45	37	23	52	49	27	66	65	50	85	71	50
338	Motor		20	28	23	0	41	34	18	48	45	20	56	55	43	82	68	0
347	Guide Vane		25	22	19	0	33	31	0	41	40	0	44	44	33	72	64	0
348	Guide Vane Seal Ring																	
383	Shaft Seal																	
386	Guide Vane Flange																	

DIMENSIONS AND WEIGHTS

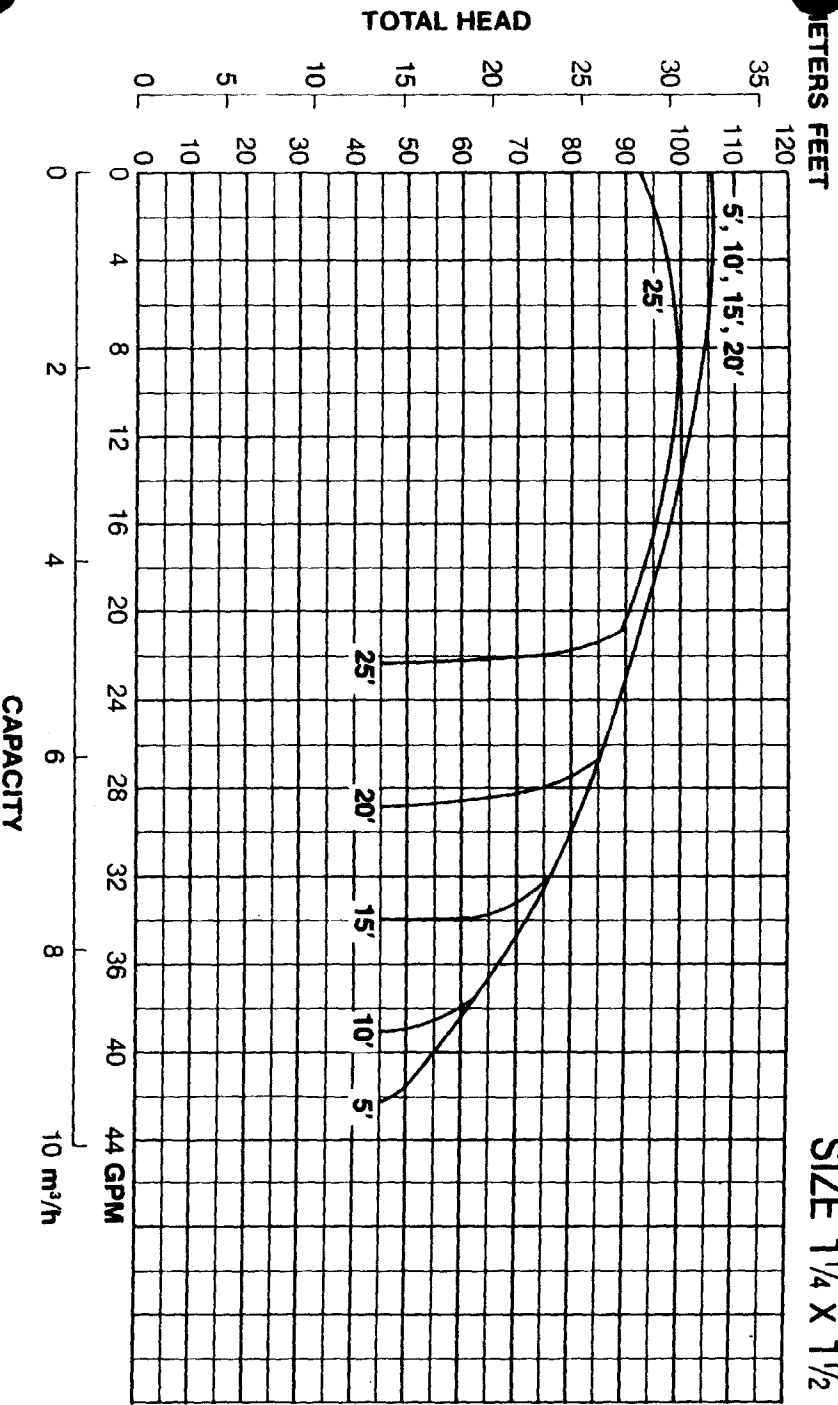
Model	HP	L	Pipe Size		Weight
			Suction	Discharge	
XSH07	¾	16 7/8	1 1/2		53
XSH10	1	17 7/8	1 1/2		56
XSH15	1 1/2	19	2	1 1/2	65
XSH20	2	19 1/2	2		77
XSH30	3	21 1/4	2	2	88

NOTE: All pipe connections are Threaded-NPT
(All dimensions in inches and weights in lbs.)
(Do not use for construction purposes.)



Close-Coupled Self-Priming Pumps

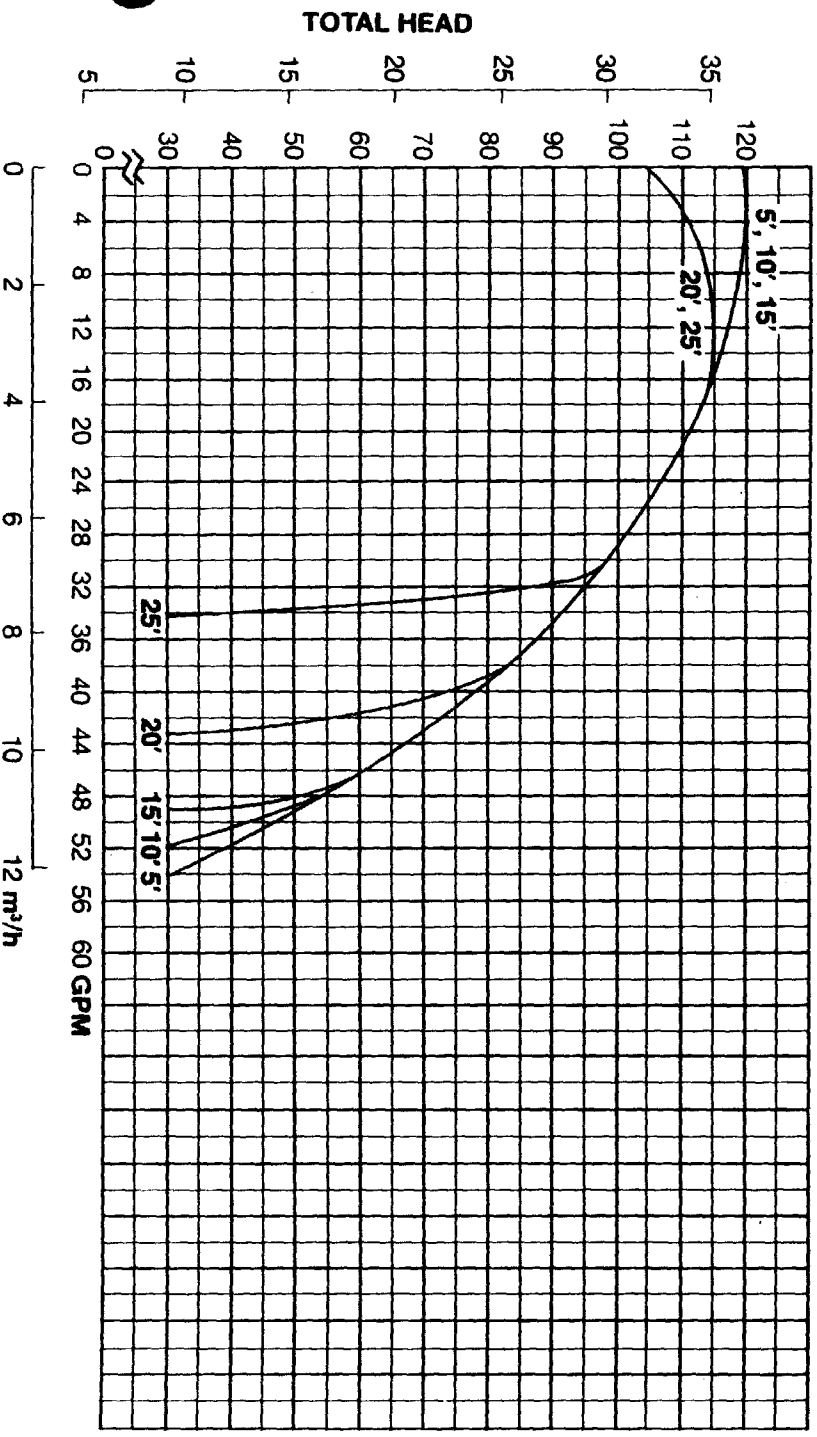
MODEL XSH07
SIZE 1¹/₄ X 1¹/₂



GOULDS PUMPS, INC.
SENECA FALLS, NEW YORK 13148

MODEL XSH10
SIZE 1¹/₂ X 1¹/₂

METERS FEET



EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-X7</u>
NAME	<u>AIR COMPRESSOR</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u>QUINCY</u>
DISTRIBUTOR	<u>Scales Air Compressor</u>
	<u>28 Parker Street</u>
	<u>Wallingford, CT 06492</u>
	<u>203-288-3181</u>
DESCRIPTION	<u>Model OEH-15, 2 Stage Air Compressor</u>
	<u>60 CFM at 100 PSI</u>
	<u>120 gallon tank</u>
	<u>15 HP, 230V, 3Ø, TEFC</u>
	<u>Automatic drain, pressure switch</u>
MAINTENANCE	<u>Check oil weekly</u>
	<u>Change oil twice annually</u>
COMPONENT PARTS	
SPARE PARTS	



28 PARKER STREET, WALLINGFORD, CT 06492 • (203) 288-3181 TELEX 12-68

To: TREATEK
OFFICIAL CHEMICAL CORP.
2801 LONG ROAD
GRAND ISLAND N.Y. 14072

Your Ref: STAMFORD P.O. No.
 Our Ref: Tel. 716-773-84
 Date: 6/11/91

Gentlemen: ATTN: Mr. Bill Derwick

We are pleased to quote on the air compressor and/or accessory equipment as described in detail below:

AIR COMPRESSOR:

Specifications:	Model & Mfr.	Proposed	Alternate
Regulation	<u>QUINCY</u>	<u>QEH-15</u>	
Receiver Size	<u>120 GALLON</u>	<u>AUTO-DUAL</u>	
Performance:	Driver HP <u>15</u> Voltage <u>230</u> Phase <u>3</u>		
	Piston Displacement @ R.P.M. <u>63-5 CFM @ 1150 RPM</u>		
	Free Air Delivery @ psig <u>60-8 CFM @ 100 PSI</u>		
Price:	Above unit, each/F.O.B. <u>FACTORY</u>	<u>\$2952</u>	

RECOMMENDED ACCESSORY EQUIPMENT

	Description	Price/F.O.B.
Belt Guard	<u>FULLY ENCLOSED</u>	<u>INCLUDED</u>
Starter	<u>SQUARED-SIZE 2 - NEMA-4</u>	<u>\$500.00</u>
Aftercooler/Separ. & Dry	<u>NO PRESSURE SWITCH - NEMA-4</u>	<u>\$294.00</u>
	<u>15 HP TEFC MOTOR - A</u>	<u>\$750.00</u>
	<u>7639 float drain</u>	<u>\$87.00</u>
	<u>Intake filter-with weather hood</u>	<u>\$100.00</u>

All prices plus applicable tax (Indicate if resale or exempt use)

Guarantee: One year, parts + labor.

Terms of Payment: Deposit With Order Balance: NET-30

(Subject to Credit Approval)

Time of Shipment: STOCK - Week of June 24, no problem.

Should you have any questions or require additional information please feel free to contact us.

FINANCING SECURITY AGREEMENT

The undersigned grants to Scales Air Compressor a security interest in the collateral described herein.

Accepted by.....

Yours truly,

SCALES AIR COMPRESSOR CORPORATION

Ross Dr.

**QE SERIES AIR COOLED AND TANK MOUNTED
AIR COMPRESSORS 175 PSIG CONTINUOUS RUN CAPABILITY**

QE PERFORMANCE DATA

MODEL	H.P.	CFM PISTON DISPL.	CFM FAD 175 PSIG	BORE & STROKE (INCHES)	COMPRESSOR R.P.M. @ 175 PSIG	HORIZONTAL RECEIVER (GALLONS)	VERTICAL RECEIVER (GALLONS)	APPROX. SHIPPING WEIGHT
QE-3	3	12.7	10.1	2 cyl. 4½ & 2½ x 3	460	80	60	565 lbs. 256.3 KG
QE-5	5	21.6	18.1	2 cyl. 4½ & 2½ x 3	780	80	60	575 lbs. 261.0 KG
QE-7.5	7.5	29.7	24.2	2 cyl. 4½ & 2½ x 3	1075	80	60	585 lbs. 265.6 KG
QE-10	10	43.8	35.6	2 cyl. 6 & 3¼ x 4	660	80	—	810 lbs. 367.7 KG
QE-15	15	63.5	51.2	2 cyl. 6 & 3¼ x 4	960	120	—	1570 lbs. 715.8 KG
QE-20	20	89.0	77.3	4 cyl. 6 & 3¼ x 4	680	120	—	2320 lbs. 1052.3 KG
QE-25	25	108.7	94.4	4 cyl. 6 & 3¼ x 4	830	120	—	2370 lbs. 1075.0 KG
QE-30	30	123.1	106.9	4 cyl. 6 & 3¼ x 4	940	120	—	2470 lbs. 1120.4 KG
QEG-5	*GAS	23.1	19.5	2 cyl. 4½ & 2½ x 3	838	30	—	510 lbs. 231.5 KG

*Briggs & Stratton or Kohler Engine available.

MANUFACTURING THE WORLD'S FINEST COMPRESSORS!

We reserve the right to change specifications without incurring any obligation for equipment previously or subsequently sold.

Specifications may be changed without liability or advance notice.

Quincy
Compressor Division

Colt Industries



QA-002-C 11/87

Printed in U.S.A.

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

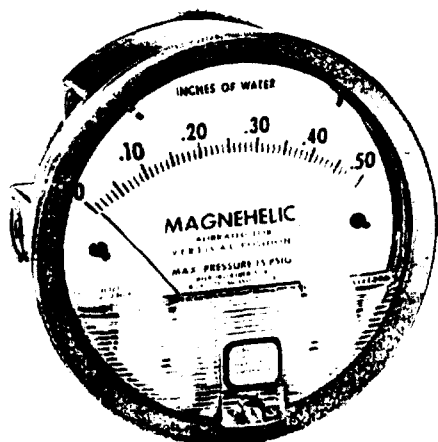
EQUIPMENT NO.	<u>SS2-G1</u>
NAME	<u>MAGNEHELIC AIR PRESSURE GAUGES</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u></u> <u></u> <u></u> <u></u>
DISTRIBUTOR	<u></u> <u></u> <u></u> <u></u>
DESCRIPTION	<u>Dwyer series 2000</u> <u>magnehelic pressure gauge</u> <u></u> <u></u> <u></u>
MAINTENANCE	<u></u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u>

Dwyer

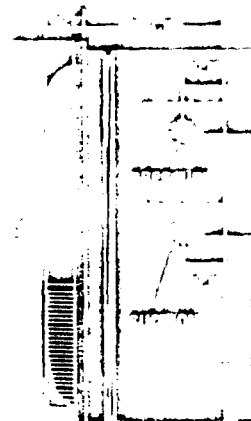
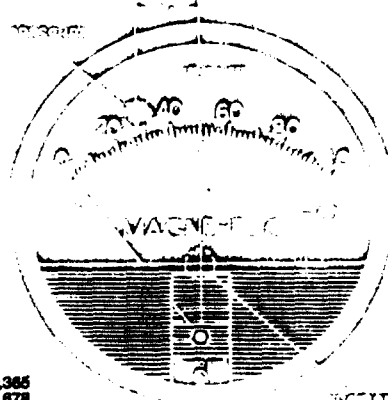
SERIES 2000

Magnehelic Differential Pressure Gage

Indicate low air or gas pressures — positive, negative or differential. Accurate within 2%. 81 Ranges.



Patent Nos. 4,030,365
5,012,678



Standard Magnehelic Pressure Gages are also available in 1/2" and 1" diam.

Dimensions: Standard Series 2000 Magnehelic Pressure Gage (slightly different on medium and high pressure models)

Select the Dwyer Magnehelic® gage for high accuracy — guaranteed within 2% of full scale — and for the wide choice of 81 ranges available to suit your needs precisely. Using Dwyer's simple, frictionless Magnehelic® movement, it quickly indicates low air or non-corrosive gas pressures — either positive, negative (vacuum) or differential. The design resists shock, vibration and over-pressures. No manometer fluid to evaporate, freeze or cause toxic or leveling problems. It's inexpensive, too.

Widely used to measure fan and blower pressures, filter resistance, air velocity, furnace draft, pressure drop across orifice plates, liquid levels with bubbler systems and pressures in fluid amplifier or fluidic systems. It also checks gas-air ratio controls and automatic valves, and monitors blood and respiratory pressures in medical care equipment.

Mounting. A single case size is used for most ranges of Magnehelic gages. They can be flush or surface mounted with standard hardware supplied. With the optional A-610 Pipe Mounting Kit they may be conveniently installed on horizontal or vertical 1 1/4"-2" pipe. Although calibrated for vertical position, many ranges above 1 inch may be used at any angle by simply re-zeroing. However, for maximum accuracy, they must be calibrated in the same position in which they are used. These characteristics make Magnehelic gages ideal for both stationary and portable applications. A 4 1/2" hole is required for flush panel mounting. Complete mounting and connection fittings plus instructions are furnished with each instrument.



Flush... Surface... or Pipe Mounted

Vent valves

In applications where pressure is continuous and the Magnehelic gage is connected by metal or plastic tubing which cannot be easily removed, we suggest using Dwyer A-310A vent valves to connect gage. Pressure can then be removed to check or re-zero the gage.

HIGH AND MEDIUM PRESSURE MODELS

Installation is similar to standard gages except that a 4 3/4" hole is needed for flush mounting. The medium pressure construction is rated for internal pressures up to 35 psig and the high pressure up to 80 psig. Available in all ranges. Because of larger case, will not fit in portable case. Weight 1 lb., 10 oz. (Installation of the A-321 safety relief valve on standard Magnehelic gages often provides adequate protection against infrequent overpressure; see Bulletin S-101).

PHYSICAL DATA

Ambient temperature range: 20° to 140°F.*

Rated total pressure: -20" Hg. to 15 psig.†

Connections: 1/4" NPT high and low pressure duplicated — one pair side and one pair on back.

Housing: Die cast aluminum. Case and aluminum parts Iridite-dipped to withstand 168 hour salt test. Exterior finish is baked dark gray hammerlic.

Standard ranges: See facing page.

Accuracy: Plus or minus 2% of full scale (3% on and 4% on -00 ranges), throughout range at 70°F.

Standard accessories: Two 1/4" NPT plugs for duplicate sure taps, two 1/4" pipe thread to rubber tubing adapters, three flush mounting adapters with screws. (Mounting and snap ring retainer substituted for 3 adapters in MP gage accessories.)

Weight: 1 lb. 2 oz.

*Low temperature models available as special option.
†For applications with high cycle rate within gage total sure rating, next higher rating is recommended.
Medium and High pressure options at lower left.

OPTIONS AND ACCESSORIES

Transparent overlays

Furnished in red and green to highlight and emphasize critical pressure.

Adjustable signal flag

Integral with plastic gage cover; external reset screw. Available in ranges (not high pressure). Can be derated with gage or separately.

Portable units

Combine carrying case with any Magnehelic gage of standard range (high pressure). Includes 9 ft. of 1/4" rubber tubing, stand-hang bracket, a terminal tube with holder.

Air filter gage accessory package

Adapts any standard Magnehelic use as an air filter gage. Includes minimum surface-mounting bracket with screws, two 5 ft. lengths of 1/4" aluminum tubing, two static pressure taps and two molded plastic vent valves integral compression fittings on tips and valves.



Quality design and construction features

Bezel provides flange for flush mounting in panel.

Clear plastic face is highly resistant to breakage. Provides undistorted viewing of pointer and scale.

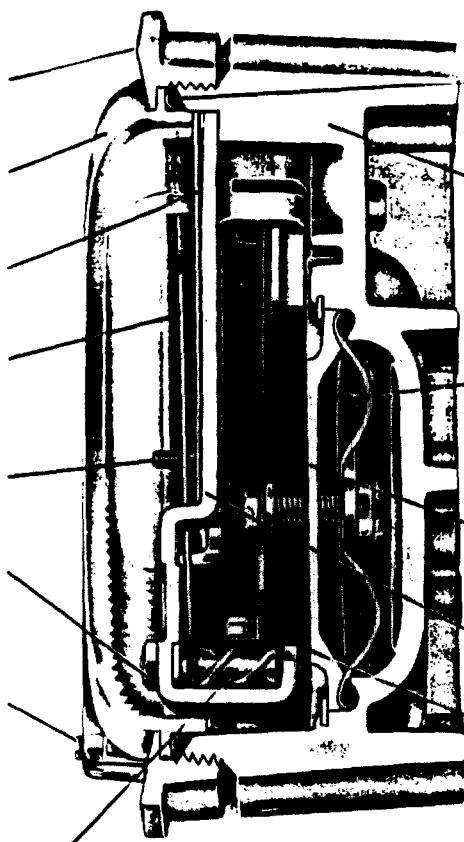
Precision litho-printed scale is accurate and easy to read.

Red tipped pointer of heat treated aluminum tubing is easy to see. It is rigidly mounted on helix shaft.

Pointer stops of molded rubber prevent pointer over-travel without damage.

Sapphire bearings are shock-resistant mounted; provide virtually friction-free motion for helix. Motion damped with high viscosity silicone fluid.

Zero adjustment screw is conveniently located in plastic cover, accessible without removing cover. "O" ring seal provides pressure tightness.



"O" ring seal for cover assures pressure integrity of case.

Die cast aluminum case is precision made. Iridite-dipped to withstand 168 hour salt spray test. Exterior finished in baked dark gray hammerloid. One case size used for all standard pressure ranges, and for both surface and flush mounting.

Silicone rubber diaphragm with integrally molded "O" ring is supported by front and rear plates. It is locked and sealed in position with a sealing plate and retaining ring. Diaphragm motion is restricted to prevent damage due to overpressures.

Calibrated range spring is a flat leaf of Swedish spring steel in temperature compensated design. Small amplitude of motion assures consistency and long life. It reacts to pressure on diaphragm. Live length adjustable for calibration.

"Wishbone" assembly provides mounting for helix, helix bearings and pointer shaft.

Samarium cobalt magnet mounted at end of range spring rotates helix without mechanical linkages.

Helix is precision milled from an alloy of high magnetic permeability, deburred and annealed in a hydrogen atmosphere for best magnetic qualities.

Mounted in jeweled bearings, it turns freely to align with magnetic field of magnet to transmit pressure indication to pointer.

SERIES 2000 MAGNEHELIC® — MODELS AND RANGES

The models below will fulfill most requirements. Page 5 also shows examples of special models built for OEM customers. For special scales furnished in ounces per square inch, inches of mercury, metric units, etc., contact the factory.

Model Number	Range, Inches of Water	Minor Div.	Model Number	Range, Zero Center Inches of Water	Minor Div.	Dual Scale Air Velocity Units			Model Number	Range, CM of Water	Minor Div.	Model Number	Range, Pascals	Minor Div.
						Model Number	Range, Inches of Water	Range, Air Velocity F.P.M.						
2000-00†	0-.25	.005	2300-0†	.25-0.25	.01	2000-00AV†	0-.25	300-2000	2000-15CM	0-15	.50	2000-60 Pa†	0-60	2.0
2001	0-.50	.01	2301	.5-0.5	.02	2000-0AV†	0-.50	500-2800	2000-20CM	0-20	.50	2000-125 Pa†	0-125	5.0
2002	0-1.0	.02	2302	1-0-1	.05	2001AV	0-1.0	500-4000	2000-25CM	0-25	.50	2000-250 Pa	0-250	5.0
2003	0-2.0	.05	2304	2-0-2	.10	2002AV	0-2.0	1000-5600	2000-50CM	0-50	1.0	2000-500 Pa	0-500	10.0
2004	0-3.0	.10	2310	5-0-5	.20	2010AV	0-10	2000-12500	2000-80CM	0-80	2.0	2000-750 Pa	0-750	25.0
2005	0-4.0	.10	2320	10-0-10	.50	For use with pitot tube.			2000-100CM	0-100	2.0	Zero Center Ranges		
2006	0-5.0	.10	2330	15-0-15	1.0				2000-150CM	0-150	5.0	2300-250 Pa	125-0-125	5.0
2008	0-6.0	.20	Model Number	Range, PSI	Minor Div.	Model Number	Range, MM of Water	Minor Div.	2000-200CM	0-200	5.0	2300-500 Pa	250-0-250	10.0
2010	0-8.0	.20							2000-250CM	0-250	5.0	Model Number Range, Kilopascals Minor Div.		
2015	0-10	.20	2201	0-1	.02	2000-6MM†	0-6	.20	Zero Center Ranges			2000-1 kPa	0-1	.02
2020	0-15	.50	2202	0-2	.05	2000-10MM†	0-10	.20	2300-4CM	2-0-2	.10	2000-1.5 kPa	0-1.5	.05
2025	0-20	.50	2203	0-3	.10	2000-25MM	0-25	.50	2300-10CM	5-0-5	.20	2000-2 kPa	0-2	.05
2030	0-25	.50	2204	0-4	.10	2000-50MM	0-50	1.0	2300-30CM	15-0-15	1.0	2000-3 kPa	0-3	.10
2040	0-30	1.0	2205	0-5	.10	2000-80MM	0-80	2.0	†These ranges calibrated for vertical scale position.			2000-4 kPa	0-4	.10
2050	0-40	1.0	2210*	0-10	.20	2000-100MM	0-100	2.0				2000-5 kPa	0-5	.10
2060	0-50	1.0	2215*	0-15	.50	Zero Center Range						2000-8 kPa	0-8	.20
2080	0-60	2.0	2220*	0-20	.50							2000-10 kPa	0-10	.20
2100	0-80	2.0	2230**	0-30	1.0	2300-20MM†	10-0-10	.50				2000-15 kPa	0-15	.50
2150	0-100	2.0	*MP option standard									2000-20 kPa	0-20	.50
	0-150	5.0	**HP option standard									2000-25 kPa	0-25	.50
												2000-30 kPa	0-30	1.0

Suggested Specifications

A differential pressure gage for measuring (state purpose) shall be installed. Gage shall be the diaphragm-actuated dial type 4 1/4" O.D., with white dial, black figures and graduations and pointer zero adjustment. Gage shall be Dwyer Instruments, Inc., Magnehelic®, Catalog No. _____ reading to _____" water column, in _____" divisions.

Special Purpose Ranges

Scale No. 2401	Scale No. 2402
Square Root	Blank Scale
Specify Range	Specify Range

Model 2000-00N, Range - .05 to + .20" W.C. For room pressure monitoring.

Zero Center Ranges		
2300-1 kPa	.5-0-.5	.02
2300-3 kPa	1.5-0-1.5	.10

Suggested Specifications

A differential pressure gage for measuring (state purpose) shall be installed. Gage shall be the diaphragm-actuated dial type 4 3/4" O.D., with white dial, black figures and graduations and pointer zero adjustment. Gage shall be Dwyer Instruments, Inc., Magnehelic®, Catalog No. _____ reading to _____" water column, in _____ divisions.

Special Purpose Ranges

Scale No. 2401 Square Root Specify Range
Scale No. 2402 Blank Scale Specify Range
Model 2000-00N, Range — .05 to + .20" W.C. For room pressure monitoring.

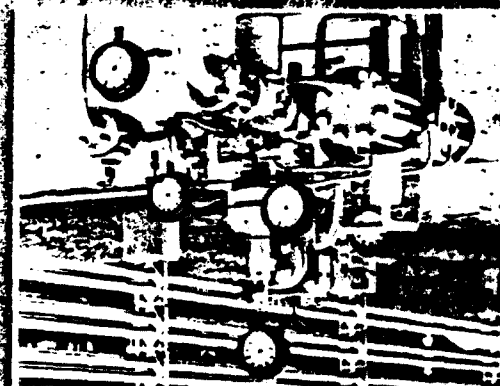
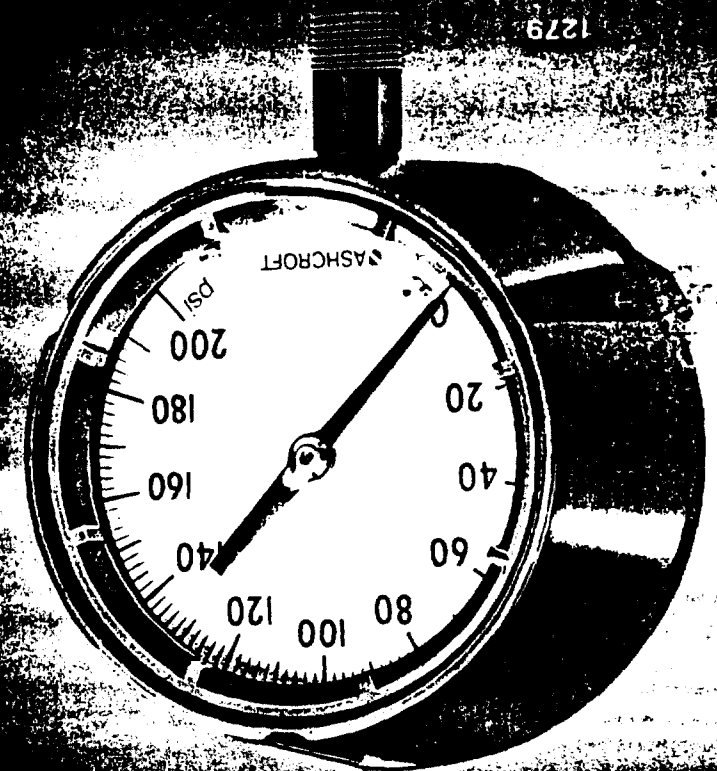
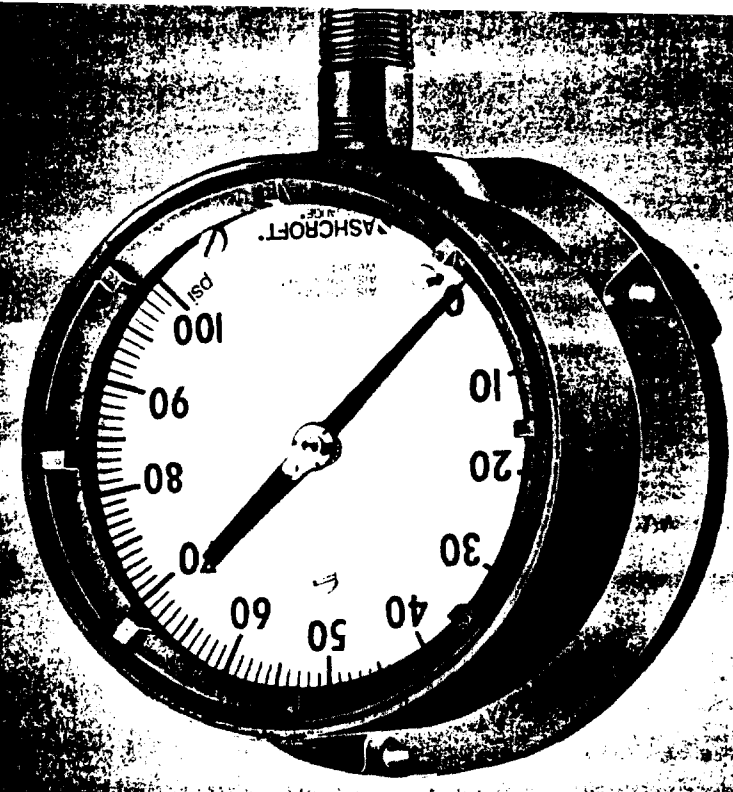
EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

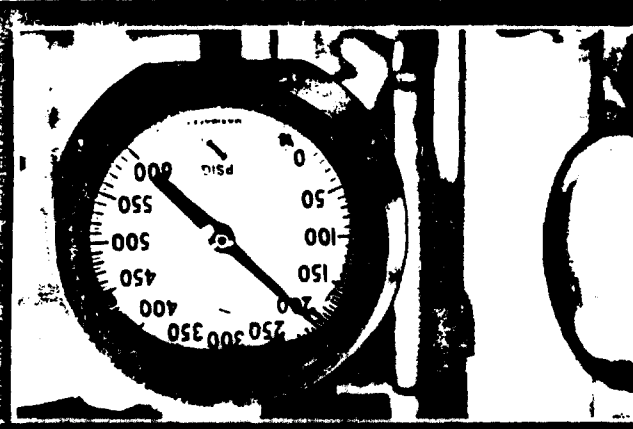
EQUIPMENT NO.	<u>SS2-G2</u>
NAME	<u>WATER PRESSURE GAUGES</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u></u> <u></u> <u></u> <u></u>
DISTRIBUTOR	<u></u> <u></u> <u></u> <u></u>
DESCRIPTION	<u>Duragauge pressure gauge 1279/1379</u> <u></u> <u></u> <u></u> <u></u>
MAINTENANCE	<u></u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u>

PURAGAUGE

Pressure Gauge 1279/1379



This rugged, solid front aluminum case gauge is tops in its field. It is available as a weather-proof, hermetically sealed or liquid filled version in 4 1/2" and 6" sizes in pressures to 20,000 psi and to 30,000 psi in K-monet. Like the 1279 it can be easily field converted from the weather-proof version to either the sealed or liquid filled version using a special kit. The 6" weather-proof gauge is available to 100,000 psi. Additionally, 8 1/2" - 1379 weather-proof gauges to 80,000 psi are offered. All size cases are coated with black epoxy which stands up well in most environmental conditions.



The solid front Ashcroft phenol case gauge is truly an industry first. Offered in 4 1/2" size, weather-proof, hermetically sealed or liquid filled versions. The weather-proof gauge is easily field converted to a hermetically sealed or liquid filled gauge with a special kit. The kit is described on page 17. Molded threads at the front and rear of the case provide axial seals with the use of threaded rings. The ring is glass filled polypropylene. In the weather-proof version, the pressure relief back is polypropylene, fastened with stainless steel screws.

DURAGAUGE®

Pressure Gauge

Gauge Accuracy

Duragauge gauges are made in accordance with ANSI B40.1 (Gauges, Pressure and Vacuum, Indicating Dial Type — elastic element), Accuracy Grade 2A ($\pm 0.5\%$ of span). Because of hysteresis, the accuracy of gauges over 20,000 psi, through 100,000 psi, is 1 to 2% depending on range and Bourdon tube material. The accuracy of a retard range gauge applies only to the expanded portion of the scale. The error in the compressed portion is -10 to +20% of the span.

Maximum pressure at which a gauge is continually operated should not exceed 75% of full scale range.

To Order a Gauge:

Select:

1. Case type number — Table A
2. Dial size — Table A
3. Bourdon System (*) (ordering code) — Table B

4. Connection: Location — Table A; Size — Table B
5. Mounting accessory or variation (if required) — Table A
6. Pressure Range — page 9
7. Accessories and optional features — pages 12-17

Example:

1279(*)S 4½" S
phenol-solid front 4½" AISI 316 st. st. system

Back ½" NPT w/1278M Ring 0/2000 psi
Back Conn. ½" NPT with 1278 Ring 0/2000 psi

TABLE A — CASE SELECTION

Case Type Number	Dial Size — in.	Case Style	Case: Material Finish	Style Ring: Material Finish	Mounting and Connection
1279(*)S**	4½	Solid Front	Phenol Black	Threaded Reinforced Polypropylene Black	Stem — Lower or Back Surface — Lower or Back Flush — Back: order 1278M ring. (see page 16)
1377(*)S	4½, 6, 8½	Solid Front	Aluminum Black epoxy coated	Hinged Steel Black wrinkle enamel coated	Flush — Back connection only
1379(*)S**	4½, 6, 8½	Solid Front	Aluminum Black epoxy coated	Threaded Reinforced Polypropylene: 4½, 6 Aluminum: 8½ Black	Stem — Lower or Back Surface — Lower or Back Flush — Back: 8½" std. 4½", 6" — order 1278M ring (See page 16)
2462(*)S	6	Solid Front	Polypropylene (fiberglass reinforced) Black	Bayonet Lock Polypropylene Black	Stem — Lower or Back Surface — Lower or Back: Specify XBF Flush — Back: Specify XBQ

(*) Bourdon tube ordering code.

** Available Liquid Filled or Hermetically Sealed — see page 17.

TABLE B — BOURDON SYSTEM SELECTION (1)

Ordering Code	Bourdon Tube and Tip Material (all joints TIG welded except "A")	Socket Material	Tube Type	Range Selection Limits (psi)	NPT Connection (2)
A	Grade A Phosphor Bronze Tube — Brass Tip, Silver Brazed	Brass	Drawn C-Tube	12/1000	½
B	AISI 4130 alloy steel	AISI 1019 steel	Drawn C-Tube	15/1500	
			Drawn Helical	2000/5000	
D	AISI 4130 alloy steel	AISI 316 stainless steel	Drawn Spiral	100,000 ⁽³⁾	¼ high pressure (lower conn. only)
R	AISI 316 stainless steel	AISI 1019 steel	Drawn C-Tube	15/1500	½
			Drawn Helical	2000/20,000	
S	AISI 316 stainless steel	AISI 316 stainless steel	Drawn C-Tube	12/1500	
			Drawn Helical	2000/20,000	
TA	AISI 316 stainless steel	AISI 316 stainless steel	Drawn Spiral	30,000/80,000 ⁽³⁾	¼ high pressure
P ⁽⁴⁾	K Monel	Monel 400	Drawn C-Tube	15/1500	½
			Drawn Helical	2000/30,000	

(1) For selection of the correct Bourdon system material, see the media application table on page 10.

(2) Optional connections available: ¼ NPT where ½ NPT is standard.

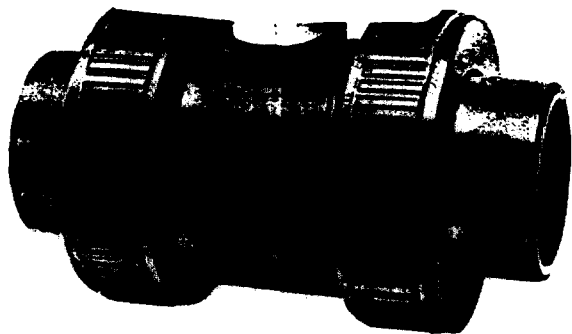
(3) 30,000-80,000 psi available in 6" lower & back and 8½" back connection only Type 1377-1379 solid front cases. 100,000 psi available in 6" lower connection only Type 1379 solid front case.

(4) Use for applications where NACE standard MR-01-75 is specified.

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-V1</u>
NAME	<u>PVC BALL VALVES</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u></u> <u></u> <u></u> <u></u>
DISTRIBUTOR	<u></u> <u></u> <u></u> <u></u>
DESCRIPTION	<u>Hayward, 0.75-inch, 1-inch,</u> <u>2-inch, and 3-inch</u> <u>TRUE UNION BALL VALVES</u> <u></u> <u></u>
MAINTENANCE	<u></u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u>



Safe Block™ True Union Ball Valve

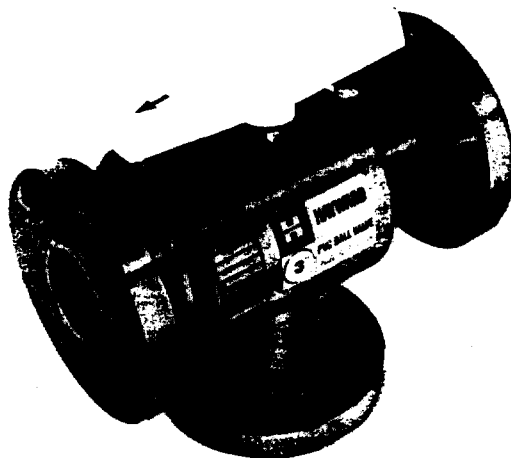
Provides quick 1/4 turn on-off control for any process piping system. True Union design allows for easy disassembly of the valve or the piping system.

Safe Block design means valve can be disassembled on downstream side without leakage. Full port opening equal to pipe size. No flow restriction.

Size: 1/4" - 6"

Material: PVC / CPVC / Polypropylene

End Conn: Threaded / Socket / Flanged



Three-Way Ball Valve

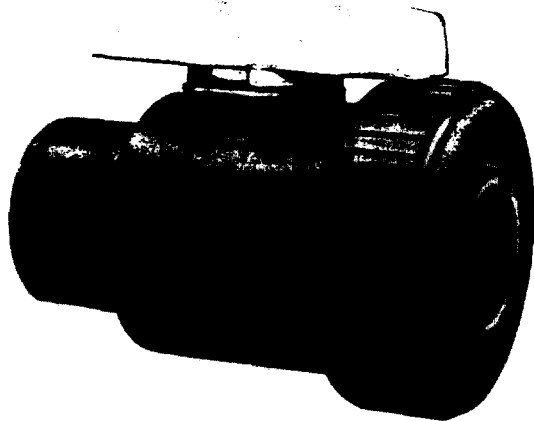
Simplifies piping systems. Allows flow to go to the right, to the left or it can shut off flow completely. All with a simple 1/4 turn of the handle.

Full port design keeps pressure drop to a minimum. Rugged, one piece molded body assures strength and safety.

Size: 1/2" - 6"

Material: PVC / CPVC

End Conn: Threaded / Socket / Flanged



Single Entry Ball Valve

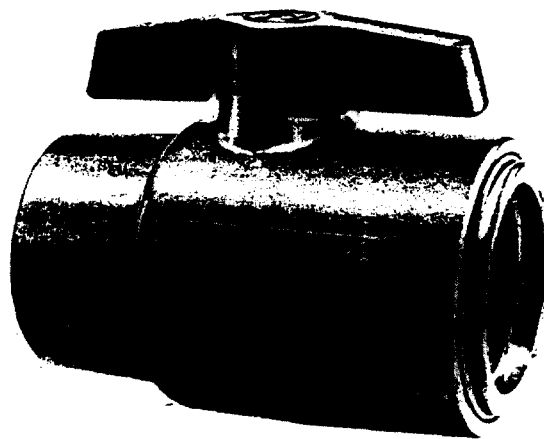
Widely used because of many years of proven service. Used where quick disassembly of the piping is unnecessary. More economical than True Union Ball Valves.

Full port opening, same as equivalent pipe size. No flow restriction. Compact, rugged design is almost indestructible.

Size: 1/4" - 6"

Material: PVC

End Conn: Threaded / Socket / Flanged



QIC® Ball Valve

Quality, Inexpensive, Compact. Ideal for use where low cost, space saving and simplicity are needed while maintaining the ruggedness and quality of an industrial plastic ball valve.

No parts to replace. No adjustments to be made. Full port design means no flow restriction.

Size: 1/2" - 2"

Material: PVC / CPVC

End Conn: Threaded / Socket

EQUIPMENT SPECIFICATION FORM

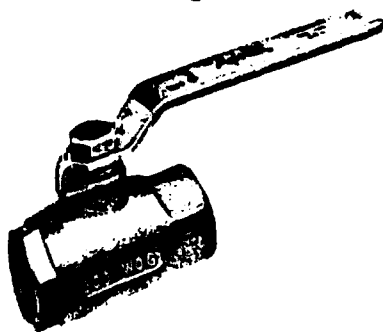
SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-V2</u>
NAME	<u>BRONZE BALL VALVES</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u></u> <u></u> <u></u> <u></u>
DISTRIBUTOR	<u></u> <u></u> <u></u> <u></u>
DESCRIPTION	<u>Apollo, 1-inch (70-105), 2-inch (70-108),</u> <u>3-inch (70-100)</u> <u></u> <u></u> <u></u>
MAINTENANCE	<u></u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u>

"Apollo" Ball Valve Division Conbraco Industries, Inc.

70-100 Series

The Original Bronze Apollo®



BRONZE THREADED ENDS

NUMBER	SIZE
70-101	1/4
70-102	3/8
70-103	1/2
70-104	3/4
70-105	1
70-106	1 1/4
70-107	1 1/2
70-108	2
70-109	2 1/2
70-100	3

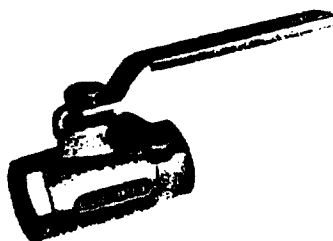
- Chromium plated ball
- Reinforced TFE seats and stuffing box ring
- Blow-out-proof stem design

OPTIONS

- 316 stainless steel ball and stem
- 1 1/4" & 2 1/4" extended stems
- Chain operated lever kit available for vertical or horizontal overhead or remote service
- Adjustable stop lever
- Steel tee handle for valves through 2"
- Locked retainer
- Static grounding devices
- Rough chrome plating
- Round handles through 2"
- Latch-lock handle through 2"
- Automatic drain through 2"

71-100 Series

Bronze Apollo® With Mounting Pad



BRONZE - THREADED

NUMBER	SIZE
71-104	3/4
71-105	1
71-106	1 1/4
71-107	1 1/2
71-108	2
71-100	3

NOTE: Cv factor same as 70-100 Series.

- Designed for deadman spring return handle, actuator mounting and panel mounting
- Reinforced TFE seats and stuffing box ring
- Meets WW-V-35C Type: II
- Composition: BZ Style: 3

OPTIONS

- Deadman spring return handle through 2"
- 316 stainless steel ball and stem
- Adjustable stop lever
- Static grounding devices
- Rough chrome plating
- Steel tee handles through 2"
- Round handles through 2"

70-200 Series

Solder End Bronze Apollo®



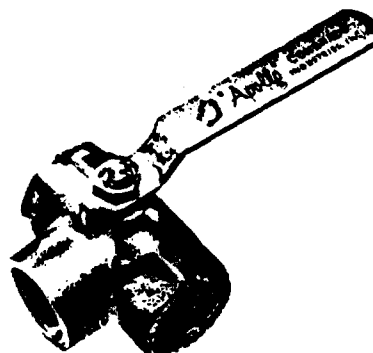
NUMBER	SIZE
70-202	3/8
70-203	1/2
70-204	3/4
70-205	1
70-206	1 1/4
70-207	1 1/2
70-208	2
70-209	2 1/2
70-200	3

- Chromium plated ball
- Reinforced TFE seats and seals
- Blow-out-proof stem design
- Meets WW-V-35C Type: II
- Composition: BZ Style: 3

The 70-200 Series is designed to be soft soldered into lines without disassembly. This allows a tested valve to be installed without disturbing the seats and seals in any way. Soldering temperature not to exceed 500°F.

70-600 Series

The Bronze 3-Way Diversion Apollo®



BRONZE 3-WAY

NUMBER	SIZE
70-603	1/2
70-604	3/4
70-605	1
70-607	1 1/2
70-608	2

- Reinforced TFE seats and seals
- Chromium plated balls
- Large ports
- 400 WOG rated
- 90° operation
- 100% tested air under water

PIPE
VALVE
FITTING
CO.

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

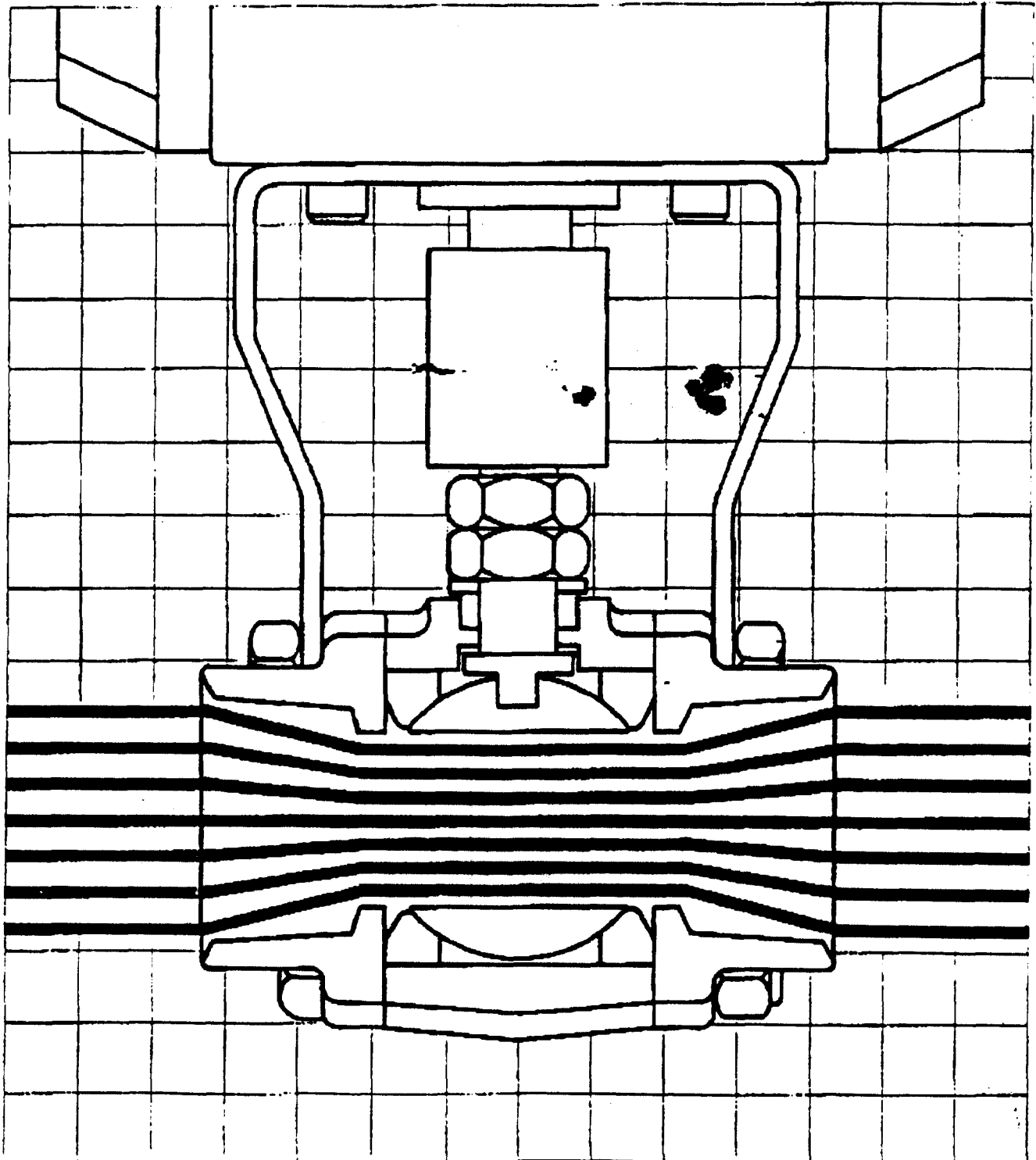
EQUIPMENT NO.	<u>SS2-V3</u>
NAME	<u>STAINLESS STEEL BALL VALVES</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u></u> <u></u> <u></u> <u></u>
DISTRIBUTOR	<u></u> <u></u> <u></u> <u></u>
DESCRIPTION	<u>Worcester, 2-inch and 3-inch,</u> <u></u> <u></u> <u></u> <u></u>
MAINTENANCE	<u></u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u>



Series 44 Ball Valves

3-piece ball valves that meet all requirements for material compatibility, shutoff, end connections and safety.

PB-401-24



How To Order

VALVE SIZE	PRODUCT SERIES	BODY, PIPE ENDS	BALL, STEM	SEAT	BODY SEAL	ENDS
$1\frac{1}{2}$ " $\frac{3}{4}$ " $\frac{1}{2}$ " $\frac{3}{8}$ " 1" 1 $\frac{1}{4}$ " 1 $\frac{1}{2}$ " 2"	4	1-Brass 4-Carbon Steel 6-316 S.S. A-Alloy 20	1-Brass* 4-Carbon Steel* 6-316 S.S. 7-Monel A-Alloy 20® C-Hastelloy C	B-Buna N-Neoprene T-TFE R-Reinforced TFE Y-Lubetal™ P-Polyfill® U-UHMWPE	B-Buna N-Neoprene T-TFE E-EPR V-Viton® M-TFE Coated 316 S.S. U-UHMWPE	SE-Screwed Pipe Ends (NPT), Any Sch. Pipe† Carbon Steel Stainless Steel Brass Alloy 20 Butt Weld Ends BW1-Stainless Steel, Sch. 10 BW4-Carbon Steel, Sch. 40 BW5-Stainless Steel, Sch. 5 TE-Solder/Sweet Ends Brass-Type K, L, or M copper tube SW-Socket Weld Ends, Any Sch. Pipe† Carbon Steel Stainless Steel Alloy 20 SWO-Socket Weld Ends, O.D. Tube Stainless Steel (not available in $\frac{1}{4}$ " and $\frac{1}{2}$ " sizes)

* Carbon Steel and Brass ball are hard chrome plated

Example: 1 $\frac{1}{2}$ " Series 44 with 316 s.s. body ball and stem, TFE seats and seals, and socket weld ends.

®Viton is a registered trademark of E.I. duPont.

™Lubetal is a trademark of Garlock.

®Polyfill is a registered trademark of Worcester Controls

®Alloy 20 is a registered trademark of Carpenter Technology

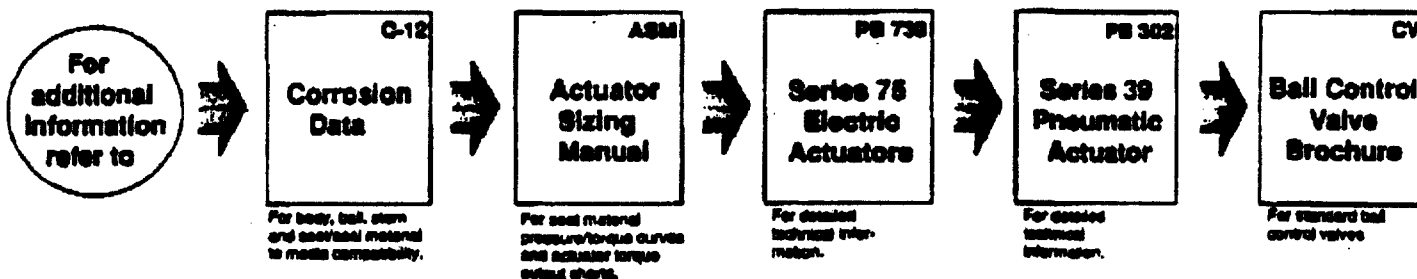
†All IPS schedules of aluminum, stainless, carbon and alloy steel pipe, S.P.S. copper pipe and red brass pipe.

Externals: Externals, including handles, are normally constructed of zinc plated carbon steel. Handles are vinyl coated. When required, the body bolts, nuts, follower, adjusting nut and handle nut are also available in stainless steel by special order, and come standard when ordering a 466 valve. Handle and stop plate are also available in stainless steel on special order.

To order a Series 44 for use with:

34 or 38 actuators, prefix ordering code with "A". EXAMPLE: 1" A 446 PMSE

38 or 75 actuators, prefix ordering code with "B".



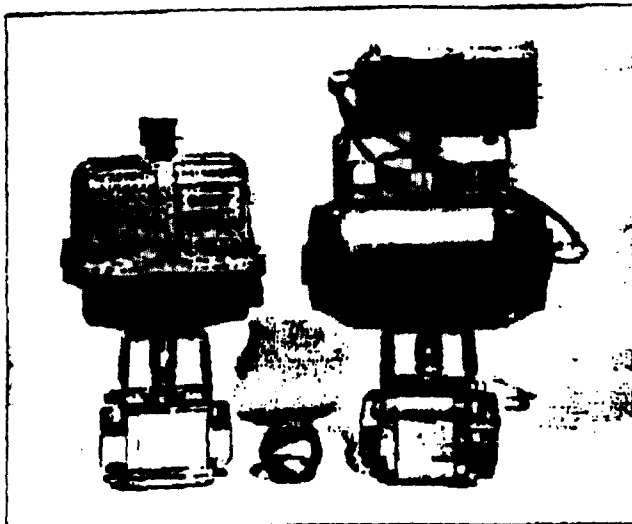
Caution: Ball valves can retain pressurized media in the body cavity when closed. Use care when disassembling. Always open valve to relieve pressure prior to disassembly.
Due to continuous development of our product range, we reserve the right to alter the dimensions and information contained in this leaflet as required.

Worcester Controls
A BTR Company

P.O. BOX 538, 33 LOCKE DRIVE
MARLBOROUGH, MA 01782
U.S.A.
(508) 481-4800 TELEX 6817563
FAX (508) 481-4454

20 MID-DOMINION ACRES
SCARBOROUGH, ONTARIO CANADA
M1S 4A5
(416) 298-1671 TELEX 065-25135
TELEFAX (416) 298-RT10

Distributed By:

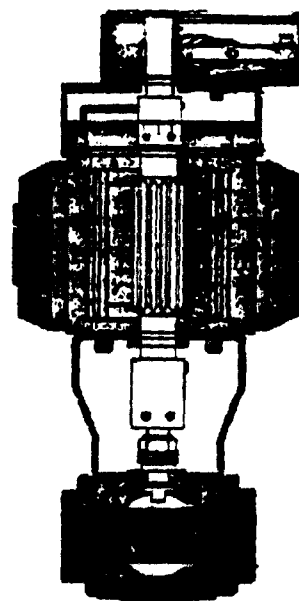


AUTOMATION PNEUMATIC AND ELECTRIC CONTROLS

Easy automation is assured by our Series 39 pneumatic or Series 75 electric actuators. Both are backed by our exclusive two-year warranty. The Series 39 actuator is the toughest and most versatile rotary actuator available. Positioners (including electro-pneumatic) fail-safe feature, and mechanical and proximity limit switches provide ON/OFF or proportional control to your system with the feedback you require. Refer to Bulletin No. PB302.

Mount a Series 75 electric actuator and you have a high performance control valve package specifically designed for computer or PLC control. For proportional control, the Series 75 can work with digital or analog control loops. A variety of options allows you to select the performance criteria and feedback information you desire. The Series 75 is available with NEMA 1, IV, VII or IX enclosures. Refer to Bulletin No. PB730.

Worcester valves represent a profound improvement over traditional globe and rotary valves that use heavy linear actuators, crank arms and associated linkage. Worcester has eliminated significant hysteresis and assured repeatability by powering through a solidly clamped, in-line stem. All shafts operate together; actuator, positioner, valve stem. The design also eliminates side load on the valve stem because components (valve, actuator, positioner) are mounted symmetrically and weights are balanced. This extends valve stem seal life far beyond conventional valves.



APPLICATIONS

- Steam Control
- Pressure Control
- Flow Control
- Temperature Control
- Level Control
- PH Control
- Low Flow Control
- High Abrasion Fluids
- Heat Transfer Fluids
- Slurry Control
- Paper Stock
- Water Flooding
- Oxygenation
- Food, Chemicals, Petroleum



EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO. SS2-V4

NAME	<u>REGULATING GLOBE VALVES</u>
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20
21	21
22	22
23	23
24	24
25	25
26	26
27	27
28	28
29	29
30	30
31	31
32	32
33	33
34	34
35	35
36	36
37	37
38	38
39	39
40	40
41	41
42	42
43	43
44	44
45	45
46	46
47	47
48	48
49	49
50	50
51	51
52	52
53	53
54	54
55	55
56	56
57	57
58	58
59	59
60	60
61	61
62	62
63	63
64	64
65	65
66	66
67	67
68	68
69	69
70	70
71	71
72	72
73	73
74	74
75	75
76	76
77	77
78	78
79	79
80	80
81	81
82	82
83	83
84	84
85	85
86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

LOCATION	<u>TREATMENT BUILDING</u>
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	
42	
43	
44	
45	
46	
47	
48	
49	
50	
51	
52	
53	
54	
55	
56	
57	
58	
59	
60	
61	
62	
63	
64	
65	
66	
67	
68	
69	
70	
71	
72	
73	
74	
75	
76	
77	
78	
79	
80	
81	
82	
83	
84	
85	
86	
87	
88	
89	
90	
91	
92	
93	
94	
95	
96	
97	
98	
99	
100	

MANUFACTURER _____

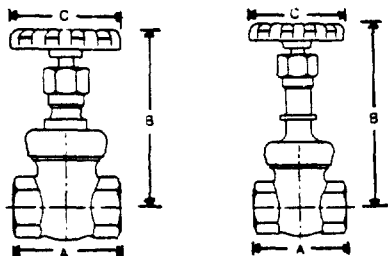
DISTRIBUTOR _____

DESCRIPTION	
	2-inch and 3-inch, #212P

MAINTENANCE

COMPONENT PARTS _____

SPARE PARTS

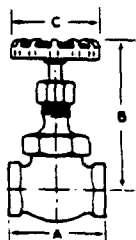
**Bronze Gate Valves****Class 300 1/4 to 3-In.****No. 634E Threaded, Rising Stem,****Union Bonnet, Solid Wedge Disc****No. 636E Threaded, Non-Rising Stem,****Union Bonnet, Solid Wedge Disc****Rated 1000 PSI 1/4 to 2-In. Non-Shock at -****20 to 150° F Rated 600 PSI 2 1/2 and 3-In.****Non-Shock at -20 to 150° F****Crane**

Used for steam, non-shock water, oil, gas and air. All bronze body with stainless steel seat rings. Packed in non-asbestos composition.

Valves have a compact, bolted bonnet design equipped with a gasket. Valves 2 in. or smaller have a union bonnet.

Meets with MSS SP-80 and Fed Spec WW-V-54D Class A Type II.

N.P.S Valve Size In.	634E		636E		End to top In.	Hand- wheel Dia. In.
	Ht. Ctr. to top In.	Wt. Lb.	Ht. Ctr. to top In.	Wt. Lb.		
1/4	4.86	.9	3.44	.8	2.03	2.13
3/8	4.86	.9	3.44	.9	2.13	2.13
1/2	5.40	1.4	3.75	1.4	2.42	2.44
3/4	6.60	2.1	4.38	1.7	2.61	2.71
1	7.91	3.3	4.88	2.8	3.06	3.03
1 1/4	9.32	4.8	5.63	5.0	3.35	3.25
1 1/2	10.45	6.1	6.44	5.8	3.69	3.72
2	13.38	10.4	7.50	7.7	3.96	4.72
2 1/2	15.25	20.5	.....	.....	5.09	5.28
3	18.00	44.0	.....	.....	5.75	7.00

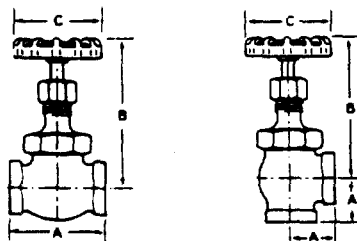
No. 212P Bronze Globe Valve**Class 200 1/4 to 3-In****Threaded, Union Bonnet, Plug Type****Disc**
Rated 400 PSI Non-Shock at -20 to +150° F**Crane**

Highly recommended for severe service and steam, non-shock water, oil, gas and air applications. Bronze body with stainless steel trim.

Valves 2 in. and smaller have compact union bonnet. 2 1/2 and 3 in. have compact bolted bonnet.

Stainless steel, renewable disc and seat ring highly resistant to scoring and corrosion.
Meets with MSS SP-80.

N.P.S Valve Size In.	End to End In.	Ht. Ctr. to top In.	Hand- wheel Dia. In.	Wt. Lb.
1/8	1.94	4.39	2.13	.8
1/4	1.94	4.39	2.13	.8
3/8	1.94	4.39	2.13	1.1
1/2	2.69	4.79	2.71	1.8
3/4	3.19	5.54	3.03	2.4
1	3.75	6.16	3.03	3.8
1 1/4	4.25	7.09	3.72	6.0
1 1/2	4.75	7.59	4.72	8.2
2	5.75	8.70	5.28	13.2
2 1/2	7.25	10.75	7.00	23.6
3	8.25	12.38	8.00	35.3

Bronze Globe and Angle Valves**Class 150 1/4 to 3-In****No. 7TF Globe, Threaded, Union****Bonnet, PTFE Disc****Rated 300 PSI Non-Shock at -20 to +150° F****No. 17TF Angle, Threaded, Union****Bonnet, PTFE Disc****Rated 150 SWP Non-Shock at -20 to 150° F****Crane**

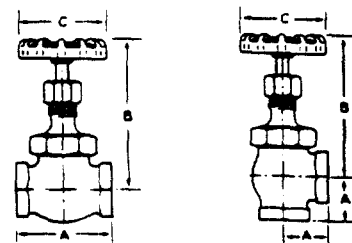
Used for saturated steam, non-shock cold water, oil, gasoline, gas and air. All bronze body. Packed in non-asbestos composition.

Valve size 2 1/2 in. to 3 in. have bolted bonnet. 2 in. and smaller have a union bonnet.

Versatile, reliable and easy to manage. Disc replacement needs only insertion of new disc into original holder.

Meets Federal Spec WW-V-51d, Class B, Type I and II regulations.

N.P.S Valve Size In.	7TF		17TF		Ht. Ctr. to Top In.	Hand wheel Dia. In.
	End to End In.	Wt. Lb.	End to End In.	Wt. Lb.		
1/8	1.94	.8	.....	.....	4.34	2.13
1/4	1.94	.9	.94	.7	4.34	2.13
3/8	1.94	.8	.94	.8	4.34	2.13
1/2	2.47	1.5	1.25	1.6	4.80	2.71
3/4	2.86	2.8	1.43	2.3	5.67	3.03
1	3.40	3.4	1.69	3.3	6.32	3.03
1 1/4	3.98	4.7	2.00	5.0	6.96	3.72
1 1/2	4.54	7.1	2.19	7.1	7.68	4.72
2	5.66	11.6	2.69	11.4	8.87	5.28
2 1/2	6.75	21.9	.....	.....	0.50	7.00
3	8.00	34.1	.....	.....	12.00	8.00

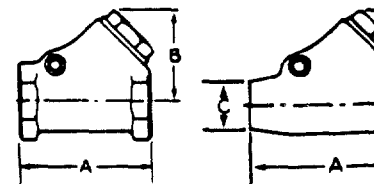
Angle and Globe Valves**Class 300 1/4 to 3-In****No. 382P Globe, Threaded, Plug Type****Disc, Union Bonnet****No. 384P Angle, Threaded, Plug Type D****Union Bonnet****Rated 1000 PSI 1/4 to 2 In. Non-Shock at****20 to +150° F****Rated 600 PSI 2 1/2 to 3 In. Non-Shock at****20 to +150° F****Crane**

Air tested for reliability especially in situations. Used for non-shock water, steam, water, oil, gas and air.

Features plug type discs made of a treated alloy which is highly resistant to corrosion, galling, scoring and temperature.

Bronze body with stainless steel trim.

N.P.S Valve Size In.	382P		384P		End to top In.	Wt. Lb.
	End to End In.	Ht. Ctr. to top In.	End to End In.	Ht. Ctr. to top In.		
1/4	1.94	4.39	1.4	1.13	4.13	1.4
3/8	1.94	4.39	1.5	1.25	4.50	1.4
1/2	2.94	4.79	2.3	1.50	5.00	2.1
3/4	3.50	5.54	2.8	1.75	6.13	3.3
1	4.12	6.16	4.3	2.06	6.75	5.0
1 1/4	4.75	7.09	8.1	2.38	7.75	7.7
1 1/2	5.25	7.59	10.9	2.63	8.75	10.9
2	6.38	8.70	19.2	3.19	10.00	18.0
2 1/2	7.50	11.50	34.4	.....	.....	.....
3	8.50	13.63	48.1	.....	.....	.....

Bronze Swing Check Valves**Class 150 1/4 to 3-In****No. 137 Threaded, Bronze Disc****No. 1342 Threaded, Solder End****Rated 300 PSI Non-Shock at -20 to +****Crane**

Used for steam, or non-shock cold water and gas. Easy maintenance. Valves installed vertically or horizontally with arrow indicating correct direction of flow.

All valves meet Military Spec MIL-V-51, Class B, Type IV requirements.

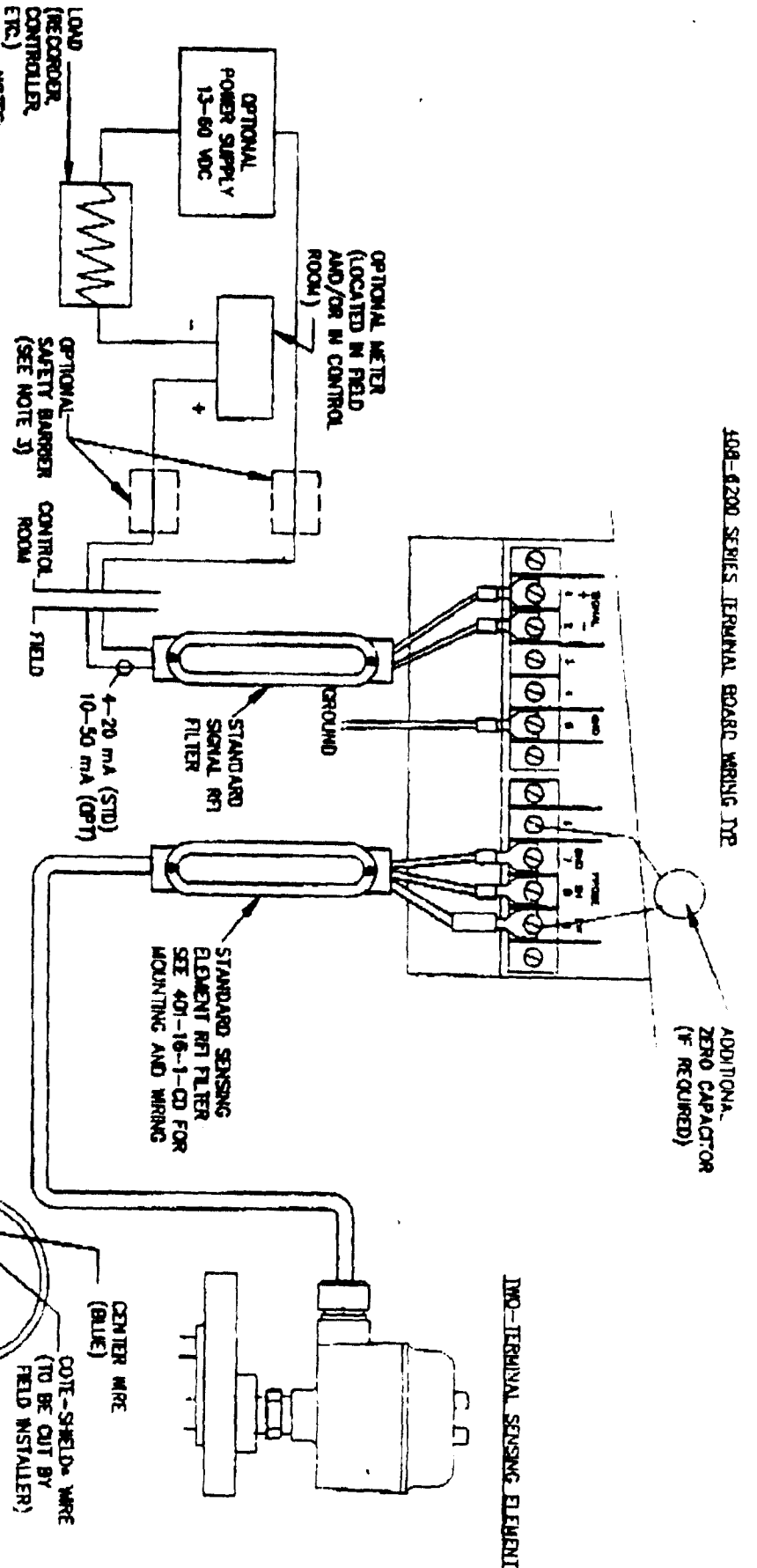
IMPORTANT: Solder or brazing alloy point must be high enough to handle pressure and temperature conditions along with prising with fluid medium.

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-S1</u>
NAME	<u>LIQUID LEVEL SENSORS AND TRANSMITTERS</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u></u> <u></u> <u></u> <u></u>
DISTRIBUTOR	<u></u> <u></u> <u></u> <u></u>
DESCRIPTION	<u>Drexelbrook</u> <u>LT 109 MODEL 508-41-101</u> <u>LT 120 508-41-101</u> <u>LT 142 508-41-101</u> <u>LT 162 508-25-16</u> <u>LT 165 508-25-6</u>
MAINTENANCE	<u></u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u>

408-A200 SERIES TERMINAL BOARD WIRING JPE



- NOTES:
- 1 ALL DEVICES MUST BE WIRED IN SERIES. VOLTAGE DRIVEN DEVICES REQUIRE A SERIES VOLTAGE DROPPING RESISTOR.
 - 2 TERMINALS 1 & 2 ARE REVERSIBLE SIGNAL TERMINALS AND CAN ALSO OPERATE WITH A MINIMUM OF 11.0 VDC. TERMINALS 3 & 4 ARE 11.5 VDC NON-REVERSIBLE. TERMINAL 3 IS (+), 4 IS (-).
 - 3 IF THE FIELD WIRING IS TO BE IN HAZARDOUS AREAS, THEN SUITABLE SAFETY BARRIERS ARE REQUIRED BETWEEN THE CONTROL ROOM AND THE FIELD TO PROVIDE FOR INTRINSICALLY SAFE FIELD WIRING.
 - 4 FOR 408-B200-02X UNIT USE 2 TERMINAL CABLE 360-XX-2 FOR CUSTOMER WIRING REFER TO DWG 410-2-28-CO

• COTE-SHIELD IS A TRADEMARK OF DREXELBROOK ENGINEERING COMPANY

CERTIFIED	BY	DATE	1988
PO#		DREXELBROOK ENG CO	
ENG		SCALE	NONE
REV		DATE	12/1/88
1	12-88-163	ISS	EDD OSH MO APP O
2		DATE	1/1/89
3		DATE	1/1/89
4		DATE	1/1/89
5		DATE	1/1/89
6		DATE	1/1/89
7		DATE	1/1/89
8		DATE	1/1/89
9		DATE	1/1/89
10		DATE	1/1/89
11		DATE	1/1/89
12		DATE	1/1/89
13		DATE	1/1/89
14		DATE	1/1/89
15		DATE	1/1/89
16		DATE	1/1/89
17		DATE	1/1/89
18		DATE	1/1/89
19		DATE	1/1/89
20		DATE	1/1/89
21		DATE	1/1/89
22		DATE	1/1/89
23		DATE	1/1/89
24		DATE	1/1/89
25		DATE	1/1/89
26		DATE	1/1/89
27		DATE	1/1/89
28		DATE	1/1/89
29		DATE	1/1/89
30		DATE	1/1/89
31		DATE	1/1/89
32		DATE	1/1/89
33		DATE	1/1/89
34		DATE	1/1/89
35		DATE	1/1/89
36		DATE	1/1/89
37		DATE	1/1/89
38		DATE	1/1/89
39		DATE	1/1/89
40		DATE	1/1/89
41		DATE	1/1/89
42		DATE	1/1/89
43		DATE	1/1/89
44		DATE	1/1/89
45		DATE	1/1/89
46		DATE	1/1/89
47		DATE	1/1/89
48		DATE	1/1/89
49		DATE	1/1/89
50		DATE	1/1/89
51		DATE	1/1/89
52		DATE	1/1/89
53		DATE	1/1/89
54		DATE	1/1/89
55		DATE	1/1/89
56		DATE	1/1/89
57		DATE	1/1/89
58		DATE	1/1/89
59		DATE	1/1/89
60		DATE	1/1/89
61		DATE	1/1/89
62		DATE	1/1/89
63		DATE	1/1/89
64		DATE	1/1/89
65		DATE	1/1/89
66		DATE	1/1/89
67		DATE	1/1/89
68		DATE	1/1/89
69		DATE	1/1/89
70		DATE	1/1/89
71		DATE	1/1/89
72		DATE	1/1/89
73		DATE	1/1/89
74		DATE	1/1/89
75		DATE	1/1/89
76		DATE	1/1/89
77		DATE	1/1/89
78		DATE	1/1/89
79		DATE	1/1/89
80		DATE	1/1/89
81		DATE	1/1/89
82		DATE	1/1/89
83		DATE	1/1/89
84		DATE	1/1/89
85		DATE	1/1/89
86		DATE	1/1/89
87		DATE	1/1/89
88		DATE	1/1/89
89		DATE	1/1/89
90		DATE	1/1/89
91		DATE	1/1/89
92		DATE	1/1/89
93		DATE	1/1/89
94		DATE	1/1/89
95		DATE	1/1/89
96		DATE	1/1/89
97		DATE	1/1/89
98		DATE	1/1/89
99		DATE	1/1/89
100		DATE	1/1/89

Drexelbrook
Engineering Company

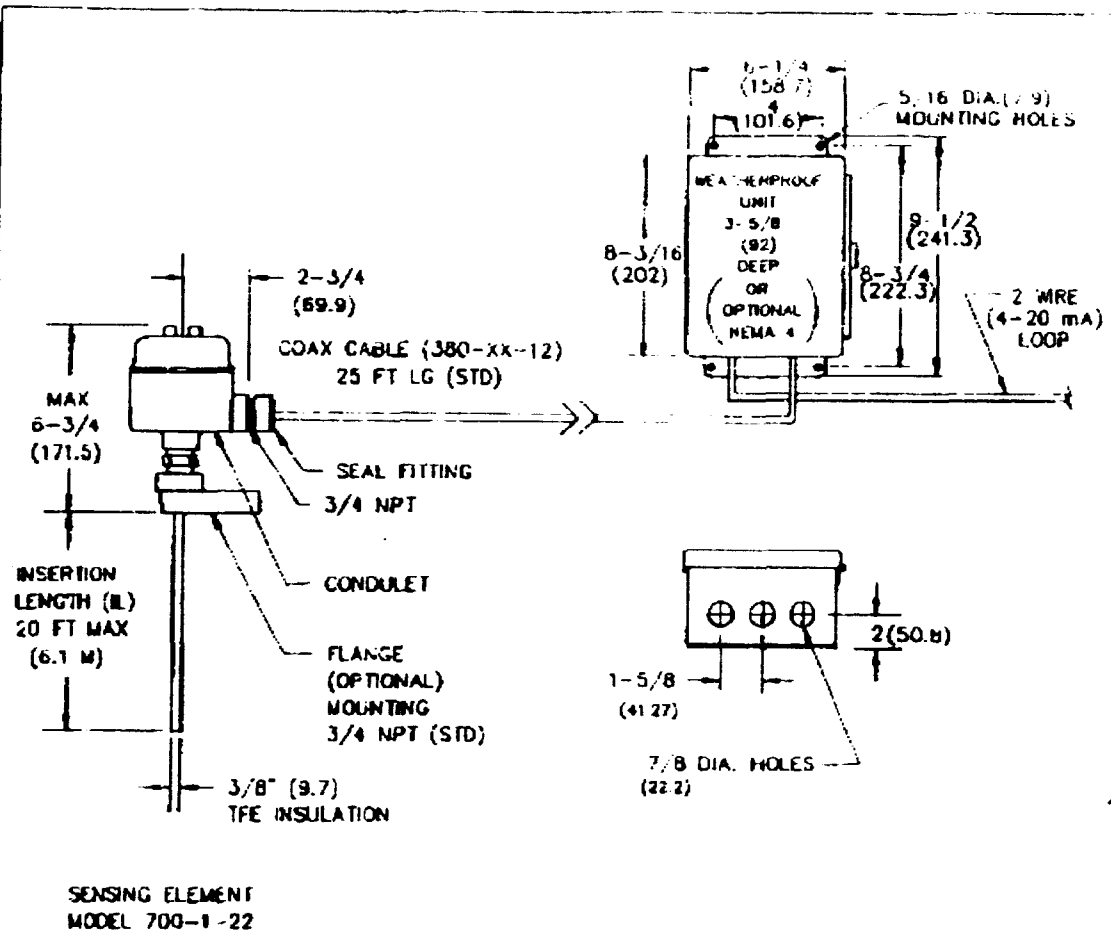
205 KEITH VALLEY RD
HORSBURGH PA 19034 9986

TEL 215-674-2731

FAX 215-674-2731

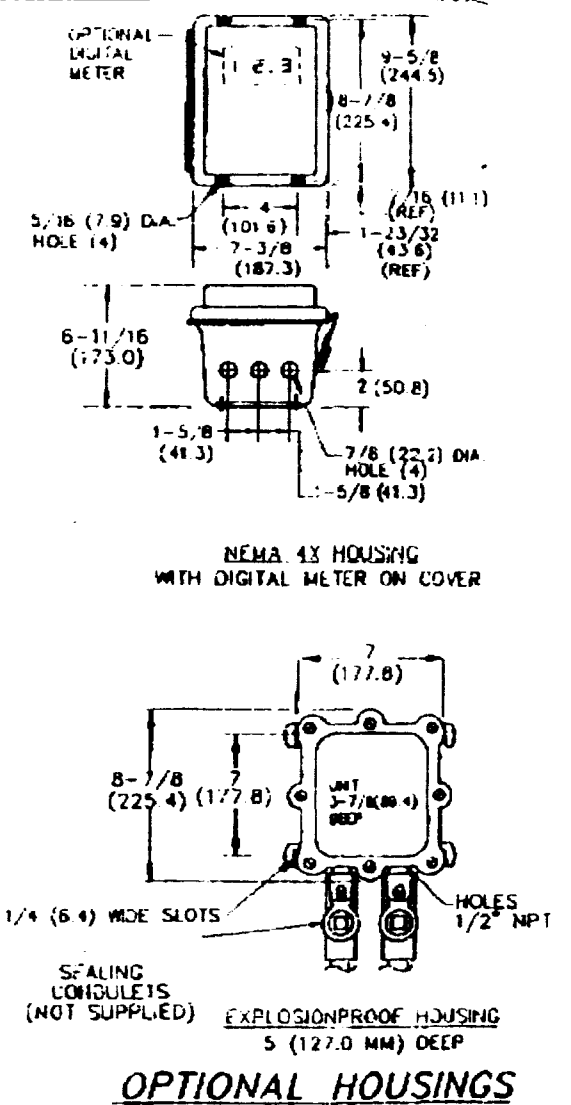
SYSTEM DIAGRAM
FOR-25-30
TWO WIRE LEVEL SYSTEM


421-100-58



SENSING ELEMENT
MODEL 700-1-22

- NOTES:
- 1 SEE SHEET 2 FOR WIRING CONNECTIONS
 - 2 SEE 401-16-XX-CD1 FOR WIRING OF OPTIONAL REF FILTERS



CERTIFIED by _____		COPYRIGHT 1988		 Drexelbrook Engineering Company 205 KEITH VALLEY RD HORSHAM, PA 19044 9906 FAX 215-674-2731		MODEL # 508-25-9 CONTINUOUS LEVEL TRANSMITTER 508-25-9 CD1	
PO # _____	_____	DREXELBROOK ENG CO					
ENG _____	_____	SCALE NONE					
USER _____	_____	UNLESS OTHERWISE STATED ALL DIMENSIONS IN INCHES UNLESS NOTED					
1	12-88-246	12/14/88	DATE				
ISS	FOO:DSR NO	APP'D	DATE				

32 10/14 11:52

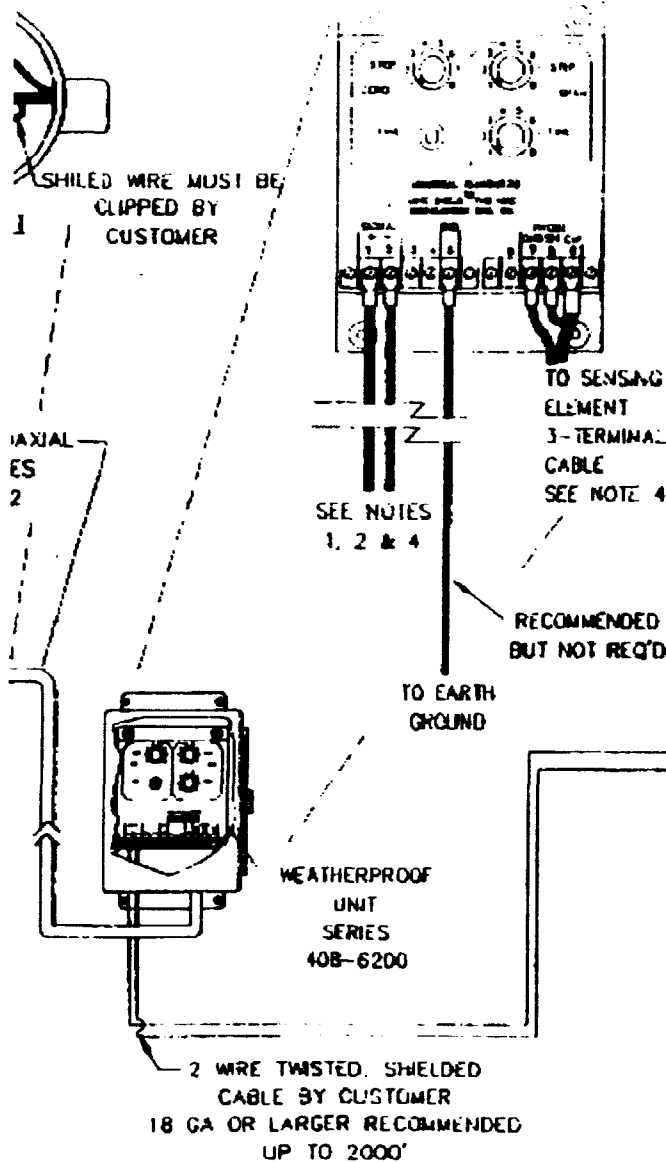
8 716 271 5259

508-25-9-CD1

RITEC

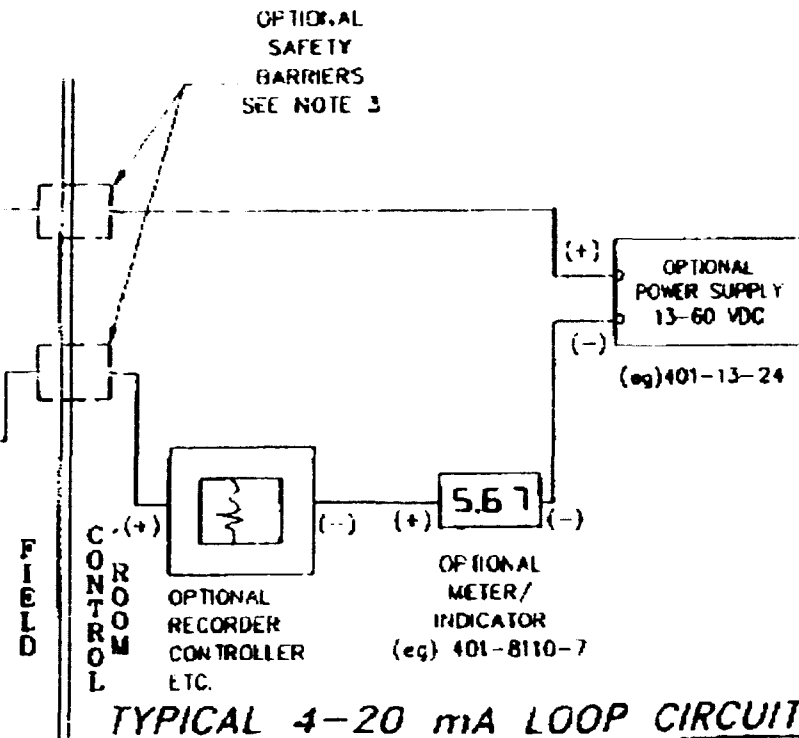
82

2

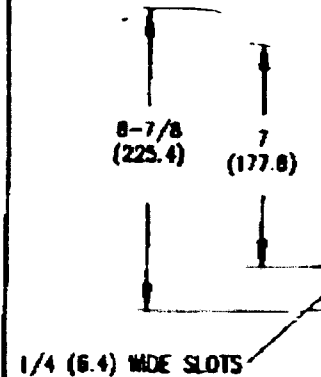


NOTES

- 1 ALL DEVICES MUST BE WIRELOOPS. SERIES VOLTAGE DRIVEN DEVICES REQUIRE A SERIES VOLTAGE DROPPING RESISTOR.
- 2 TERMINALS 1 & 2 ARE REVERSIBLE SIGNAL TERMINALS AND CAN ONLY OPERATE WITH A MINIMUM OF 13.0 VDC. TERMINALS 3 & 4 ARE ALSO SIGNAL TERMINALS. THESE TERMINALS MAY TAKE A MINIMUM OF 11.5 VDC NON REVERSIBLE. TERMINAL 3 IS (+), 4 IS (-)
- 3 IF THE FIELD WIRING IS TO BE IN HAZARDOUS AREAS, THEN SUITABLE SAFETY BARRIERS ARE REQUIRED BETWEEN THE CONTROL ROOM AND THE FIELD TO PROVIDE FOR INTRINSICALLY SAFE FIELD WIRING.
- 4 FOR WIRING OF SYSTEMS WITH OPTICAL ISOLATORS SEE 401-16-XX-CD1 OR INSTRUCTION MANUAL UNDER ACCESSORIES.



MAXIMUM LOOP RESISTANCE
H_{MAX} = 15 13 02 330 0 0VS=24V



SIGNAL RFI FILTER

OPTIONAL POWER SUPPLY 13-60 VDC

LOAD (RECORDER, CONTROLLER, ETC.)

SYSTEM NO.	SENSING ELEMENT
508-25-31	700-1-5
508-25-31	700-1-5
508-25-31	700-1-5

1	12-88-246	12/21/88	12/21/88		
ISS	EDD/DSR NO	APP'D	DATE		



Drexelbrook
Engineering Company

205 KEITH VALLEY RD
HORSHAM, PA 19044 9986

1215/674 1234

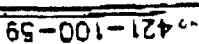
FAX 215 674 2731

MODEL # 508-25-9
CONTINUOUS LEVEL TRANSMITTER

508-25-9 CD1

2/21

CERTIFIED by
PO #
ENG
SEN



NOTE:
1 FOR CUT-OUT DIMENSIONS REFERENCE DIGITA (PANEL M16)
370-3020-0-CD1 OR ANALOG 419-2-1-CD

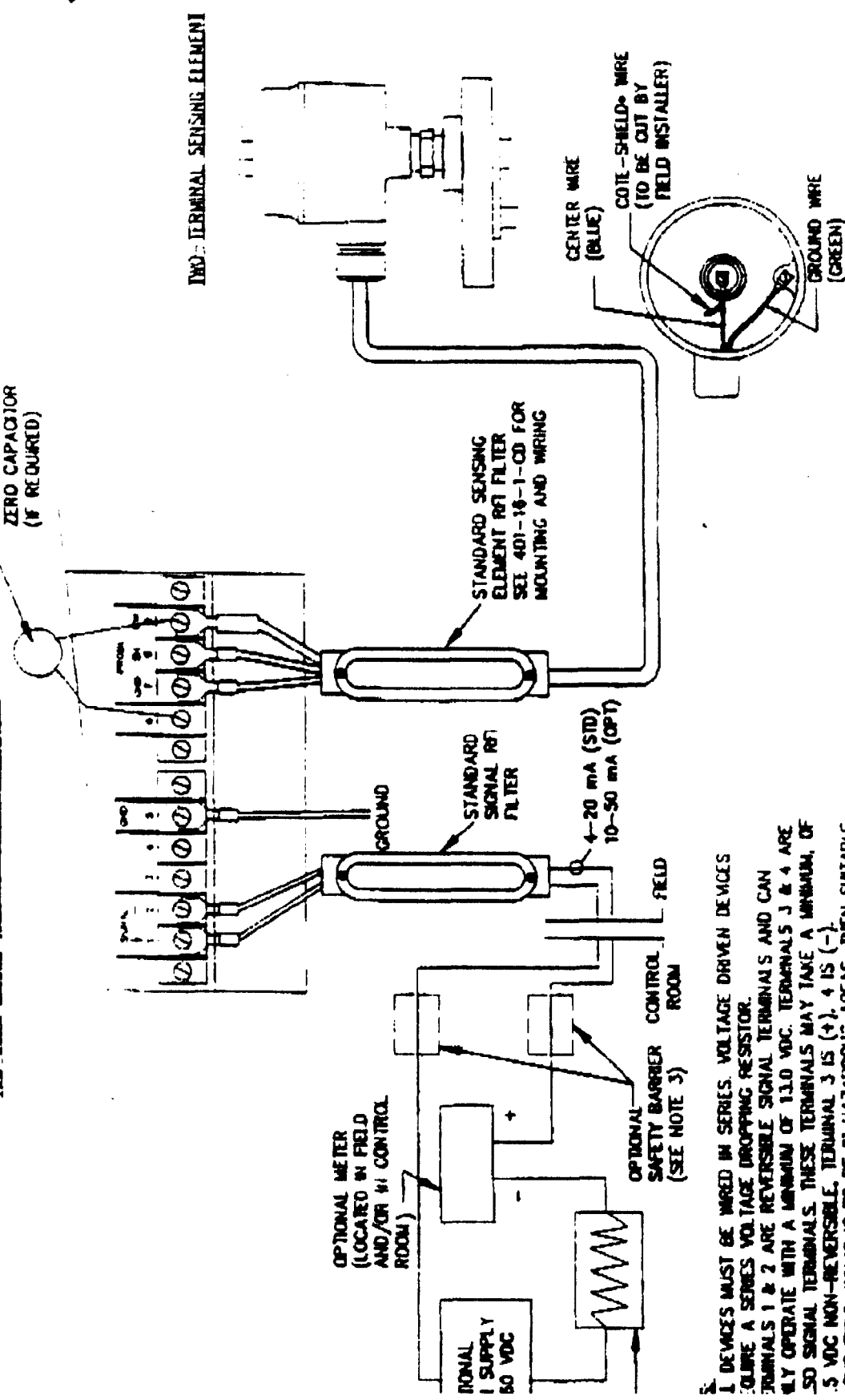
SYSTEM DIAGRAM
FOR 508-25-31
TWO-WIRE LEVEL SYSTEM
421-100-59

ded Page

421-100-59

ADDITIONAL
ZERO CAPACITOR
(IF REQUIRED)

400-620X SERIES TERMINAL BOARD WIRING I.D.



TWO-TERMINAL SENSING ELEMENT

STANDARD SENSING
ELEMENT RFI FILTER
SEE 401-16-1-CD FOR
MOUNTING AND WIRING

STANDARD
SIGNAL RFI
FILTER

4-20 mA (STD)
10-50 mA (OPT)

CENTER WIRE
(BLUE)

CODE-SHIELD WIRE
(TO BE CUT BY
FIELD INSTALLER)

GROUND WIRE
(GREEN)

SECTION A-A

• CODE-SHIELD IS A TRADEMARK OF
DREXELBROOK ENGINEERING COMPANY

1. DEVICES MUST BE WIRED IN SERIES. VOLTAGE DRIVEN DEVICES
REQUIRE A SERIES VOLTAGE DROPPING RESISTOR.
TERMINALS 1 & 2 ARE REVERSIBLE SIGNAL TERMINALS AND CAN
ONLY OPERATE WITH A MINIMUM OF 13.0 VDC. TERMINALS 3 & 4 ARE
50 SIGNAL TERMINALS. THESE TERMINALS MAY TAKE A MINIMUM OF
5 VDC NON-REVERSIBLE. TERMINAL 3 IS (+), 4 IS (-).
THE FIELD WIRING IS TO BE IN HAZARDOUS AREAS, THEN SUITABLE
SAFETY BARRIERS ARE REQUIRED BETWEEN THE CONTROL ROOM
AND THE FIELD TO PROVIDE FOR INTRINSICALLY SAFE FIELD WIRING.
FOR 400-620X-02X UNIT USE 2 TERMINAL CABLE 380-XX-2
OR CUSTOMER WIRING REFER TO DWG 418-2-28-CD

SYSTEM DIAGRAM
FOR 508-25-31
TWO WIRE LEVEL SYSTEM

Drexelbrook
Engineering Company
205 N. 11TH VALLEY RD.
HOUSTON, TX 77054-3500
12151674 12734
FAX 215 674 2731

COPYRIGHT 1988 DREXELBROOK ENG. CO.	
SCALE: NONE	
UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES	
RDC	
ISS	12-88-163
APP'D	DATE

EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-S2</u>
NAME	<u>ELECTROCHEMICAL SENSORS AND TRANSMITTERS</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u></u> <u></u> <u></u> <u></u>
DISTRIBUTOR	<u>Foxboro Inc.</u> <u>P.O. Box 217</u> <u>Grand Island, NY 14072</u> <u>716-773-5622</u>
DESCRIPTION	<u>Foxboro 871A series sensors and 870 series</u> <u>transmitters</u> <u></u> <u></u> <u></u>
MAINTENANCE	<u></u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>

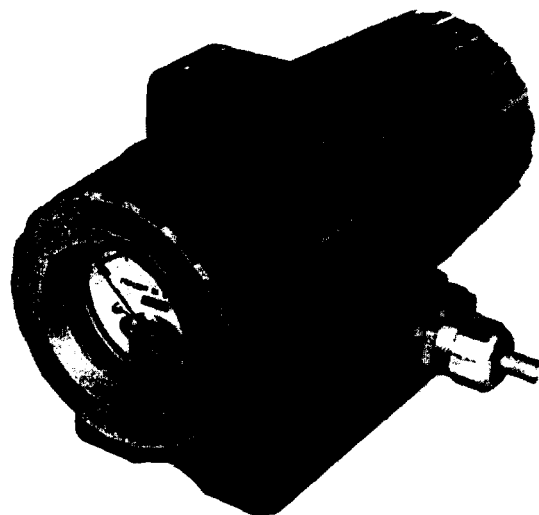
EQUIPMENT SPECIFICATION FORM

SUMMIT NATIONAL SITE

EQUIPMENT NO.	<u>SS2-S2</u>
NAME	<u>ELECTROCHEMICAL SENSORS AND TRANSMITTERS</u>
LOCATION	<u>TREATMENT BUILDING</u>
MANUFACTURER	<u></u> <u></u> <u></u> <u></u>
DISTRIBUTOR	<u>Foxboro Inc.</u> <u>P.O. Box 217</u> <u>Grand Island, NY 14072</u> <u>716-773-5622</u>
DESCRIPTION	<u>Foxboro 871A series sensors and 870 series</u> <u>transmitters</u> <u></u> <u></u> <u></u>
MAINTENANCE	<u></u> <u></u> <u></u> <u></u> <u></u>
COMPONENT PARTS	<u></u> <u></u> <u></u> <u></u> <u></u> <u></u>
SPARE PARTS	<u></u> <u></u> <u></u> <u></u> <u></u>

870 SERIES ELECTROCHEMICAL TRANSMITTERS FOR pH/ORP AND CONDUCTIVITY MEASUREMENT

- Two-Wire Design
 - signal and power over the same two wires.
- High Accuracy, Long Term Stability
- Encapsulated Electronics
 - circuits completely protected by durable, sealed housing.
- Standard Integral Junction Box



For complete specifications, refer to Product Specification Sheets PSS 6-1C1 A, 6-3C1 A, and 6-3C3 A.

The 870 Series Electrochemical Transmitters, when coupled with 871 Series Sensors, measure pH, ORP, or conductivity and transmit a 4 to 20 mA dc signal.

FUNCTIONAL SPECIFICATIONS

Span and Range Limits:

Series	Span Limits	Measurement Spans	Range Limits
870PH	1 and 14 pH 100 and 1400 mV	Any 2, 5, 10, or 14 pH Any 200, 500, 1000, 1400 mV	-2 and +16 pH -1400 and +1400 mV
870CC	1 and 20 000 μ S/cm	see "HOW TO ORDER"	0 and 20 000 μ S/cm
870EC	0.2 mS/cm and 2000 mS/cm 3% and 100% chemical concentration	see "HOW TO ORDER"	0 and 2000 mS/cm 0 and 100% chemical concentration

FUNCTIONAL SPECIFICATIONS (Continued)

Temperature Compensation Selection Guide for 870EC:

If the 870EC Range Is ...	And the Process Temperature Range Is ...		The Recommended Temperature Compensation Code Is ...	Reference Temperature	
	°C	°F		°C	°F
From: 0 to 50 μ S/cm to 0 to 100 mS/cm	5 to 100	41 to 212	D (sodium chloride)	25	77
From: 0 to 100 mS/cm to 0 to 2000 mS/cm	5 to 100	41 to 212	D (if a salt solution) E (if sulfuric acid predominates)	25	77
	5 to 85	41 to 185	G (if hydrochloric acid predominates) M (if sodium hydroxide predominates)		
From: 0 to 3% NaCl to 0 to 25% NaCl	5 to 100	41 to 212	D (sodium chloride)	25	77
From: 0 to 3% NaOH to 0 to 10% NaOH	5 to 85	41 to 185	M (sodium hydroxide)	25	77
From: 0 to 10% NaOH to 0 to 15% NaOH	5 to 85	41 to 185	N (sodium hydroxide)	25	77
From: 0 to 3% NaOH to 0 to 20% NaOH	90 to 107	194 to 225	Z (sodium hydroxide)	100	212
From: 0 to 3% HCl to 0 to 10% HCl	5 to 85	41 to 185	G (hydrochloric acid)	25	77
From: 0 to 10% HCl to 0 to 15% HCl	5 to 85	41 to 185	L (hydrochloric acid)	25	77
From: 0 to 3% H ₂ SO ₄ to 0 to 25% H ₂ SO ₄	5 to 100	41 to 212	E (sulfuric acid)	25	77
99.5 to 93% H ₂ SO ₄ or 99.5 to 96% H ₂ SO ₄	50 to 107	122 to 225	F (sulfuric acid)	50	122
0 to 10% oleum or 42 to 18% oleum	50 to 107	122 to 225	V (oleum)	65	149
0 to 10% HNO ₃	5 to 85	41 to 185	T (nitric acid)	25	77

Sensor Body Code Range Limits: See 871EC
Sensor on Page 97.

Electrical Classification: A variety of classifications,
including intrinsically safe, is available. Refer to
Foxboro for details.

Power Requirements: Requires external dc power
for operation. See "Output Signal" table on next
page.

FUNCTIONAL SPECIFICATIONS

(Continued)

Output Signal:

Output Signal (mA dc)	Supply Voltage From Separate Unit (V dc)	Allowable Loop Load (Ω)
4 to 20	14 (minimum) (a)	0
	24	0 to 450
	30	0 to 775
	40 (maximum)	0 to 1300

(a) Minimum supply voltage for 870CC only is 20 V dc.

$\pm 0.5\%$ of calibrated span (conductivity).

Repeatability: $\pm 0.1\%$ of calibrated span.

Drift: $\pm 0.25\%$ of reference span.

PHYSICAL SPECIFICATIONS

Transmitter Housing Construction: The housing and its covers are die-cast, low-copper aluminum alloy finished with blue textured epoxy paint. The covers are threaded and seat on Buna-N O-rings.

Mounting: By bracket for nominal 50 mm (2 in) horizontal or vertical pipe or by base to wall. Bracket is supplied as standard.

PERFORMANCE SPECIFICATIONS

Accuracy:

$\pm 0.1\%$ of calibrated span (pH).

HOW TO ORDER

1) SPECIFY pH AND ORP TRANSMITTER

MODEL NUMBER: 870PH-

Range:

0 to 14 pH	70
2 to 12 pH	71
4 to 14 pH	72
0 to 10 pH	73
0 to 200 mV	74
0 to 500 mV	75
0 to 1000 mV	76
0 to 1400 mV	77
-100 to +100 mV	78
-500 to +500 mV	79
Approved intermediate spans (specify)	80
Custom spans (specify)	81

Optional Features:

Indicating meter with scale per range	N
Indicating meter with scale 0 to 100% of output	P

1) SPECIFY CONTACTING CONDUCTIVITY TRANSMITTER

MODEL NUMBER: 870CC-

Range ($\mu\text{S/cm}$):

0 to 1	01
0 to 2	02
0 to 3	03
0 to 5	05
0 to 10	06
0 to 20	07
0 to 30	08
0 to 50	09
0 to 100	10
0 to 200	11
0 to 300	12
0 to 500	13
0 to 1000	14
0 to 2000	15
0 to 3000	16
0 to 5000	17
0 to 10 000	18
0 to 20 000	19
Suppressed zero (specify)	20

Optional Features:

Indicating meter with scale per range	N
Indicating meter with scale 0 to 100% of output	P
Pure water automatic temperature compensation.	
For codes 01 to 06 above only.	A

HOW TO ORDER Continued on Next Page

871A SERIES pH AND ORP SENSORS

- **Dependable, Low Maintenance Design**
 - PVDF material.
 - flat, ruggedized glass pH electrode.
 - double junction reference electrode.
 - small size.
 - no metallic wetted parts.
 - sealed electrodes.
- **Flexible Mounting**
 - 1-inch external NPT connections.
 - easy installation and removal.
 - for in line or in situ mounting.
 - full line of accessories.



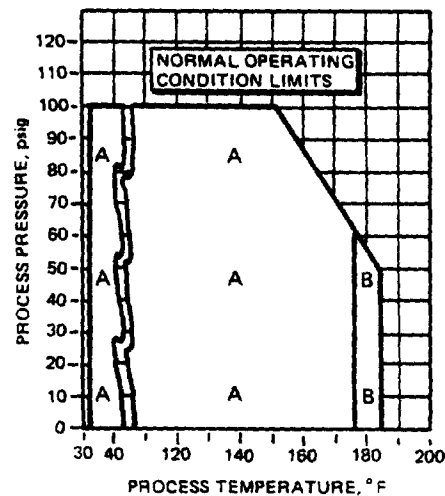
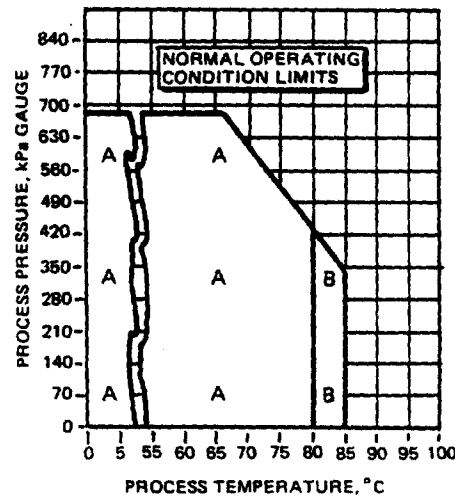
For complete specifications, refer to Product Specification Sheet PSS 6-1C2 B.

The 871A Series pH and ORP Sensors are general purpose sensors suitable for most pH and ORP measurement applications. Units are for use with 873PH Series Analyzers, 872 or 874PH Series Monitors, or 870PH Series Transmitters.

FUNCTIONAL SPECIFICATIONS

Pressure/Temperature Rating:

- A = In line or in situ mounting.
B = In line mounting only.



Temperature Compensation: Sensor includes encapsulated automatic temperature compensator (100 ohm platinum RTD) applicable over entire rated temperature range.

PHYSICAL SPECIFICATIONS

Process Wetted Parts Material:
Body: PVDF.

Measuring Electrode:
pH: Flat glass.
ORP: Platinum or gold, as specified.
Reference Electrode: Ceramic junction.

O-Ring: EPR (Ethylene Propylene Rubber).

Sensor Mounting: 1-inch external NPT on both ends. For in line or in situ mounting, as required.

Cable:

Cable Selection	Cable Length	
	with Preamplifier	without Preamplifier
Standard	3 m (10 ft) (a)	3 m (10 ft) (a)
Optional	150 m (500 ft) (b) (maximum)	15 m (50 ft) (c) (maximum)

- (a) Cable is integral with sensor assembly.
(b) Integral cable to 15 m (50 ft). For cable lengths beyond 15 m (50 ft), an extension cable is required.
(c) Integral or extension cable to a maximum total length of 15 m (50 ft).

HOW TO ORDER**1) SPECIFY MODEL NUMBER: 871A-**

— — —

Preamplifier:

- None. For use with 873PH Series Analyzer,
872-11 or 874PH Series Monitor,
or Part Number PS290AA or PS290AB
Preamplifier. 1
- Integral. For use with 873PH Series Analyzer,
872-10 or 874PH Series Monitor, or 870PH Series
Transmitter. 2

Measuring Electrode and Material:

- pH, flat glass. F
- ORP, platinum. D
- ORP, gold. E

Optional Features:

- Leads terminated with No. 6 spade terminals (d). 1
- Nonstandard integral cable length, 15 m (50 ft) maximum.
See table at top of page. 3

(d) Standard leads are No. 22 AWG wire, 3 m (10 ft) long with stripped and tinned ends, and are used with 873PH Series Analyzers or 874PH Series Monitors. The No. 6 spade terminals are for use with 872 Series Monitors and 870PH Series Transmitters.

- 2) SPECIFY CABLE LENGTH, IF NONSTANDARD** _____
- 3) SPECIFY MOUNTING HARDWARE, JUNCTION BOX, AND EXTENSION CABLE, IF REQUIRED (Refer to PSS 6-1C2 B for details)** _____
- 4) SPECIFY INFORMATION FOR INSTRUMENT TAG** _____

SECTION 4

BUILDING DESIGN GROUNDWATER TREATMENT SYSTEM

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10

PROJECT NAME: SUMMIT NAT.
STRUCTURAL

DATE: 22 SEPT. 92.

DESIGNED BY: WM 7

CHECKED BY: _____

PAGE 0 OF _____

SUMMIT NATIONAL SUPERFUND SITE

DEERFIELD, OHIO.

GROUNDWATER TREATMENT

PROCESS BUILDING.

STRUCTURAL DESIGN.

INDEX

<u>ITEM.</u>	<u>PAGE</u>
BUILDING CODE REQUIREMENTS	C
PRELIM. PILE ARRANGEMENT	1 - 2
BUILDING LOADS & CASES OF LOADING	3 - 5
ROOF DECK DESIGN.	6 - 14
COLUMN DESIGN	15 - 19
EAVE BEAM DESIGN.	20 - 26
WIND BRACING	27 - 28
CONNECTIONS	29 - 32
FOUNDATION - FINAL DESIGN	33 - 42
MISC.	43 - 49

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 7372-10
PROJECT NAME: SUMMIT NAT.
STRUCTURAL
DATE: 22 Sept 92

DESIGNED BY: WMT
CHECKED BY: _____
PAGE C OF _____

BUILDING CODE DESIGNATIONS

CODE: OHIO BASIC BUILDING CODE (OBBC - 1992)

NOTE: BASED EXTENSIVELY ON BOCA, 1990.

BUILDING USE GROUP: GROUP F-2 LOW-HAZARD
INDUSTRIAL
(WATER PUMPING PLANT)
WATER TREATMENT.

FIRE RESISTANCE RATING: - BUILDING IS ISOLATED.
- ALL NON COMBUSTIBLE MATERIALS.
- TYPE 2 C.

AREA & HEIGHT LIMITATION. - EXEMPT., CLAUSE 501.1.1

OCCUPANCY LOAD. - ACTUAL 2 (ON AVERAGE)

CODE TABLE 806.1.2

AREA = $55 \times 53 = 2915$ $41 \times 30 = 1230$ 4145 1 SQOCCUPANCY = $\frac{4145}{100} = 42$ PERSONS.

TRAVEL DISTANCE TO EXIT. CODE 807.5 - 300 FT.
ACTUAL, MAX. - 50. FT.

EGRESS WIDTH, 808.2, $0.2 \times 42 = 8.4$ "; ACTUAL 30"STRUCTURAL DESIGN LOADS

LIVE LOAD. MEDIUM INDUSTRIAL, 125 PSF.

SNOW LOADS. GROUND 25 PSF. EXPOSURE FACTOR 0.7

WIND SPEED. 80 mph IMPORTANCE " 1.0

CRA

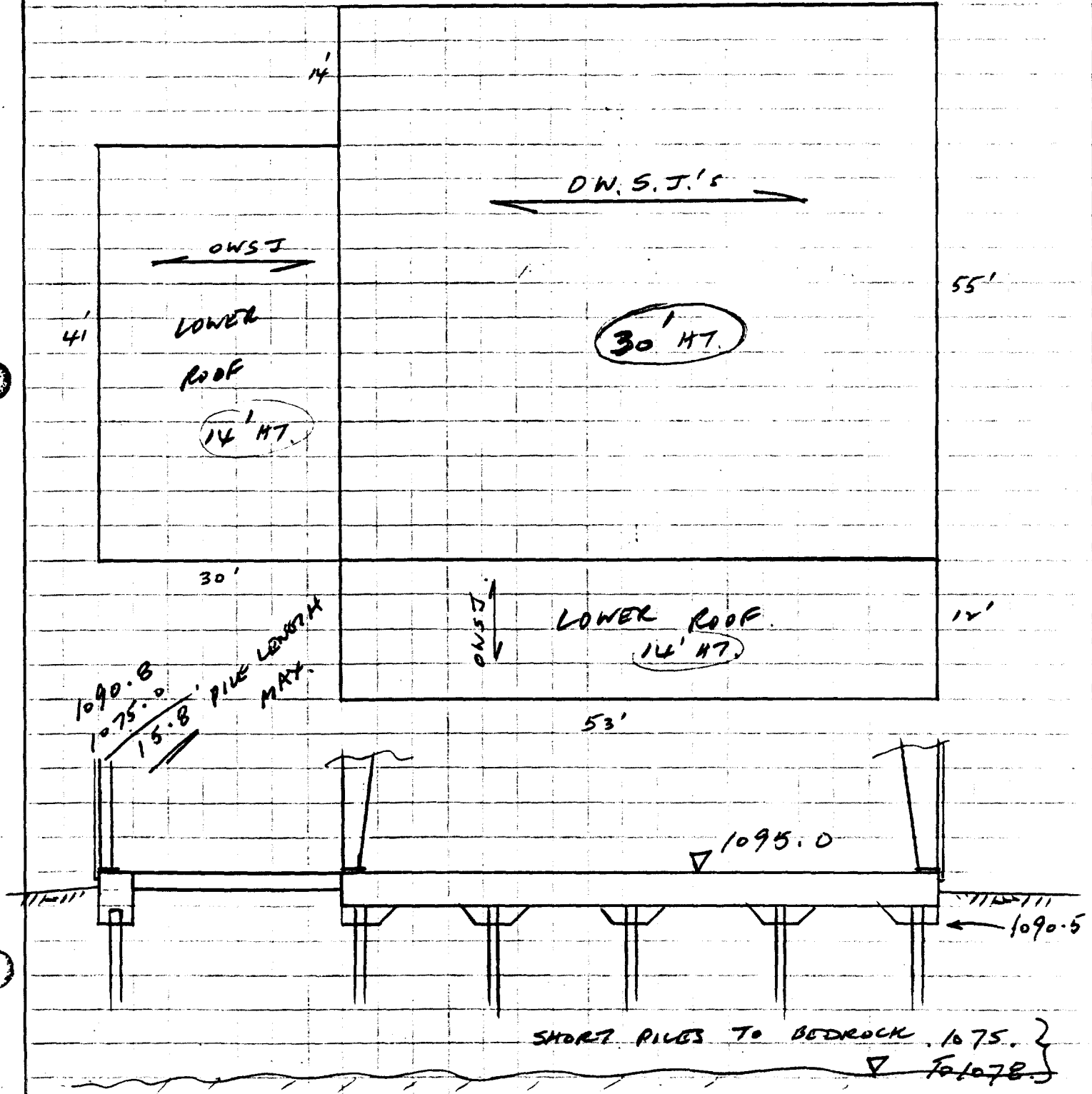
CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10
PROJECT NAME: SUMMIT. NAT.
STRUCTURAL.
DATE: 22. Sept. 92.

DESIGNED BY: WMT
CHECKED BY: PJD.
PAGE 1 OF 1

OVERALL LAYOUT

BOCA, BUILDING GROUP F-2



CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 2372-10PROJECT NAME: SUMMIT NAT.
STRUCTURALDATE: 22 Sept 92DESIGNED BY: WMTCHECKED BY: [Signature]PAGE 2 OF 2TOTAL LOADING

① MAIN BUILDING

See attached

$(55 \times 53 = 2915 \text{ sq'})$

580,500

PUMPS

1,000

PIPING, 10 psf

29,150

BUILDING, 15 psf

43,725

$$\begin{aligned} \text{SNOW:} \\ 45 \times 55 \times 53 \\ = 73,000 \# \\ \times .7 \\ = 51,100 \# \end{aligned}$$

FACTOR INCL. FLOOR SLABS.

+ LIVE COMPONENT? $2915 \times 2.5 \times 150$

OR DEPTH?

CONCRETE @ 150 psf/ft

1,093,1251,747,500 #

Assume 10 tons / pile

$\text{No piles} = \frac{1747.5}{20} = 87$

" 20 Tons / pile

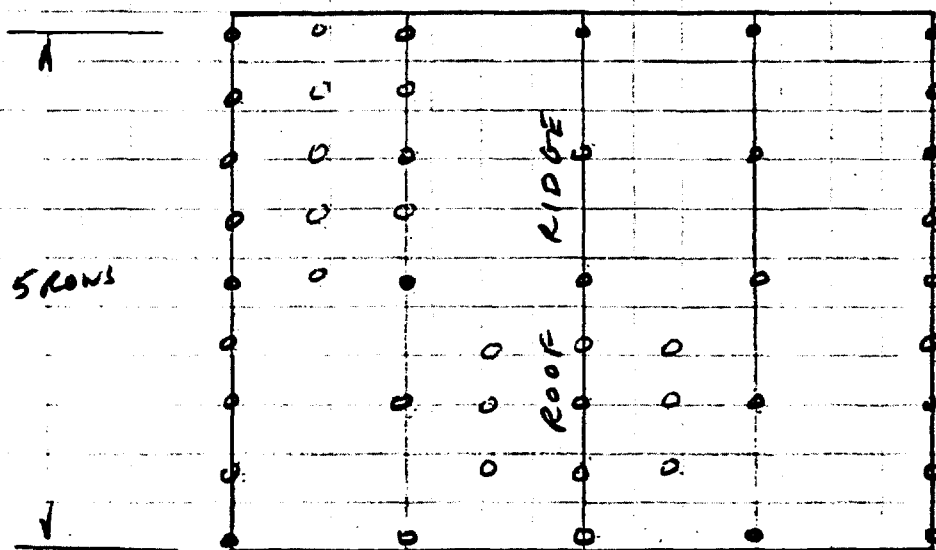
$\frac{1747.5}{40} = 44 \checkmark$

" 30 " "

$= 30$

Assume 20T for now.

POSSIBLE ARRANGEMENT.



O BASIC PATTERN.

O ADDN FOR HEAVY LOAD

O EXTRA FOR BLDG. LOADS.

SUMMIT NATIONAL

2572-10

lights of - group

Post-it® brand fax transmittal memo 7871 # of pages 1	
To: GERRY KESTLE	From: Bill DeNicle
Co. CRA	Co. TREATER-CRA
Dept.	Phone #
Fax #	Fax #

12/1

	Empty	Full
Acid Tank	950 lbs	31,300 lbs
NaOH Tank	950	32,000
Vapor Carbon	2000	8000
Squal/Aeration Tank	1100	34500
Settles	4200	11,200
Mux Tank	750	17,500
Inoc Tank	200	2300
Nut Tank	100	1100
Biotower	19400	196,400
Sand filter	8250	15,500
Sump Tank (ea)	415	13,300
Ligand tank	40,000	180,000
Sump Tank	1500	36,400
Sludge elevator	750	3000

580,500

Pumps (ea)
Blower - ea
Blower - bio (ea)
Pump - bio

70 + 70 = 140
133
150
100 + 100 = 200

603.

National

Bill

is preliminary maintenance

Here is Summit & main high

on

process 30

Henry

CRA**CONESTOGA-ROVERS & ASSOCIATES**

PROJECT No.:

2372-10

PROJECT NAME:

SUMMIT. NAT.

STRUCTURAL

DATE:

22 Sept. 92

DESIGNED BY:

NM

CHECKED BY:

JD

PAGE

3

OF

BUILDING LOADS1. DEAD LOADS.

ROOF SYSTEM

INS & PANEL

PURVINS

MAIN BEAMS

2. psf

3.

4.

5.

14 psf

2. LIVE LOADS.

SNOW.

DEERFIELD, OHIO

BOCA CODE,

SECTION 1111.0

$$P_s = C_e I P_g \quad \checkmark$$

 $C_e = \text{Exposure factor, Table 1111.4a} = 0.7 \quad \checkmark$
 $I = \text{Importance factor,} = 1.0 \quad \checkmark \quad (\text{NON-EMERGENCY})$
 $P_g = @ \text{DEERFIELD S.W. OF YOUNGSTOWN}$
 $\text{FIG 1111.2a.} = 20 \text{ psf.}$

CHECK LOCATION OF DEERFIELD ~ 25 psf OHIO /

$$P_g = 0.7 \times 1 \times 20 = 14 \text{ psf. BLDG}$$

$$P_s = 0.7 (1.0) (25 \text{ psf}) = 17.5 \text{ psf. COE}$$

WIND

BOCA

1112.3

$$P_d = P_e I^2 C_p \quad \checkmark$$

1112.3.2

WIND SPEED = 80 mph / 75 mph OHIO / BLDG / CODE

EXPOSURE C

OPEN TERRAINE

1112.3.3b.

K1-

P_e

0-20

20.0

17.5

psf

20-40

21.0

18.5

psf

$$P_e = [20 (20) + 10 (21)] / 30 = 20.3 \text{ psf} \quad \checkmark$$

NM

2,000 lbs over 2.5' 503.

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10

PROJECT NAME: SUMMIT NAT.
STRUCTURAL

DATE: 22 Sept. 92

DESIGNED BY: NM7

CHECKED BY: _____

PAGE 5 OF _____

LOADING CASES:

ROCK 1114.1

1. DL + SNOW
2. DL + WIND
3. DL + WIND + $\frac{1}{2}$ SNOW
4. DL + SNOW + $\frac{1}{2}$ WIND
5. DL + SEISMIC

SEISMIC ZONE 1. $A_v \leq 0.1$ 1113.1

IGNORE FOR THIS PRELIM. DESIGN:

I, Importance factor 1.0

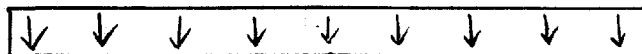
COMPLY WITH

1113.11.1 } ONLY.
+ 1113.11.2 }CASES OF LOADING FOR ULTIMATE STATES DESIGN
(ACI 318, SECTION 9) (FACTORED LOADING)

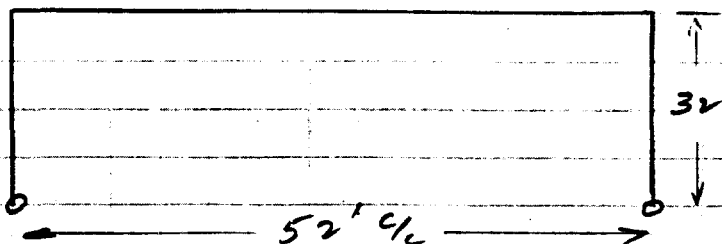
I. $U = 1.4 DL + 1.7 LL (SNOW)$

II. $U = 0.75 (1.4 DL + 1.7 LL^{(S)} + 1.7 WL)$

III. $U = 0.9 DL + 1.3 WL$

ASSUME HINGED (PINNED) BOTTOM CONNECTIONS.CASE I

D.L. + S.L.



CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10

PROJECT NAME: SUMMIT

NATIONAL

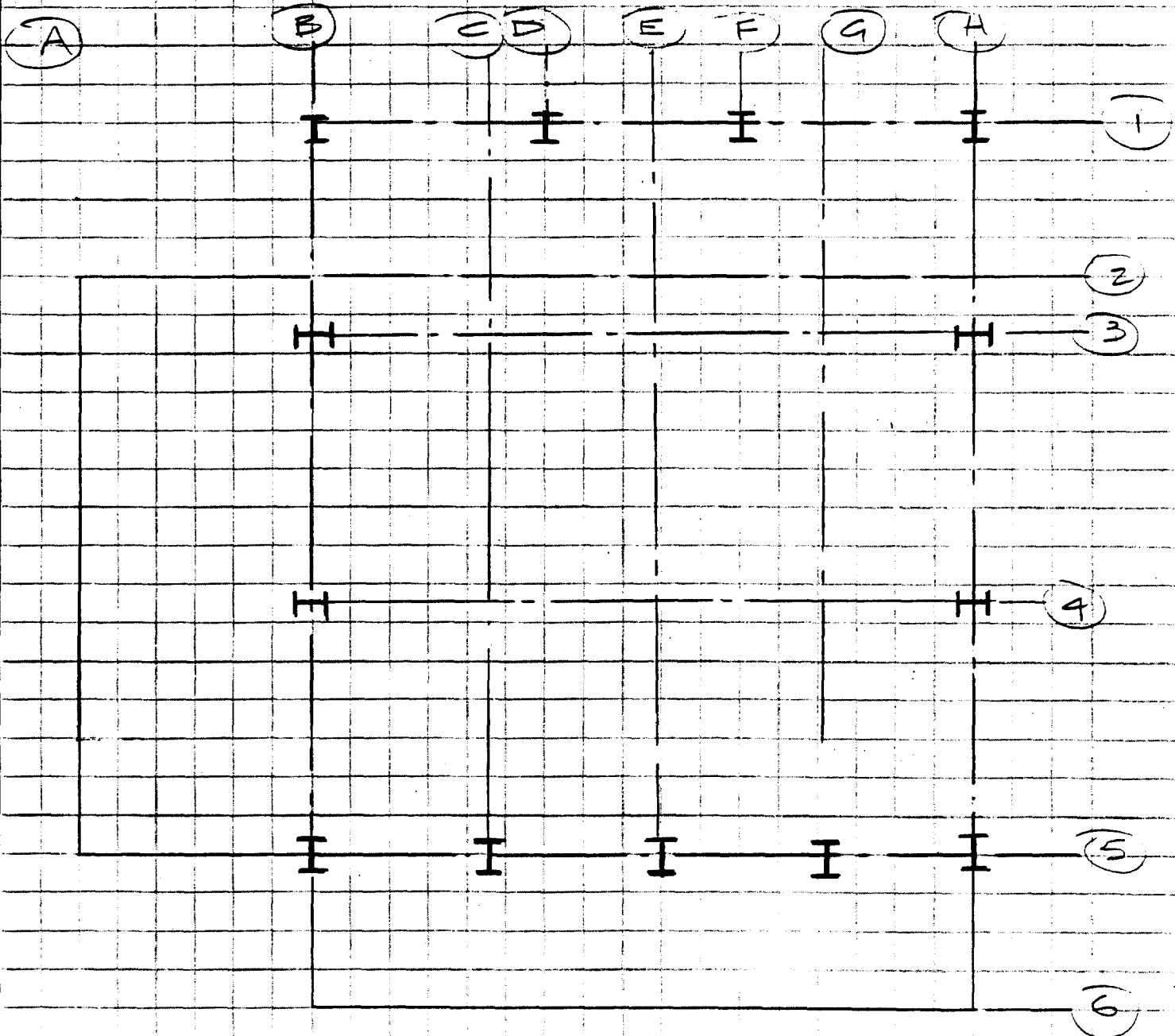
DATE: OCT 8/92

DESIGNED BY: FJD

CHECKED BY: mm?

PAGE 6 OF

COLUMN LINES



X

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 2372-10PROJECT NAME: SUMMITNATIONALDATE: OCT. 1/92DESIGNED BY: PDCHECKED BY: MM?PAGE 7 OF

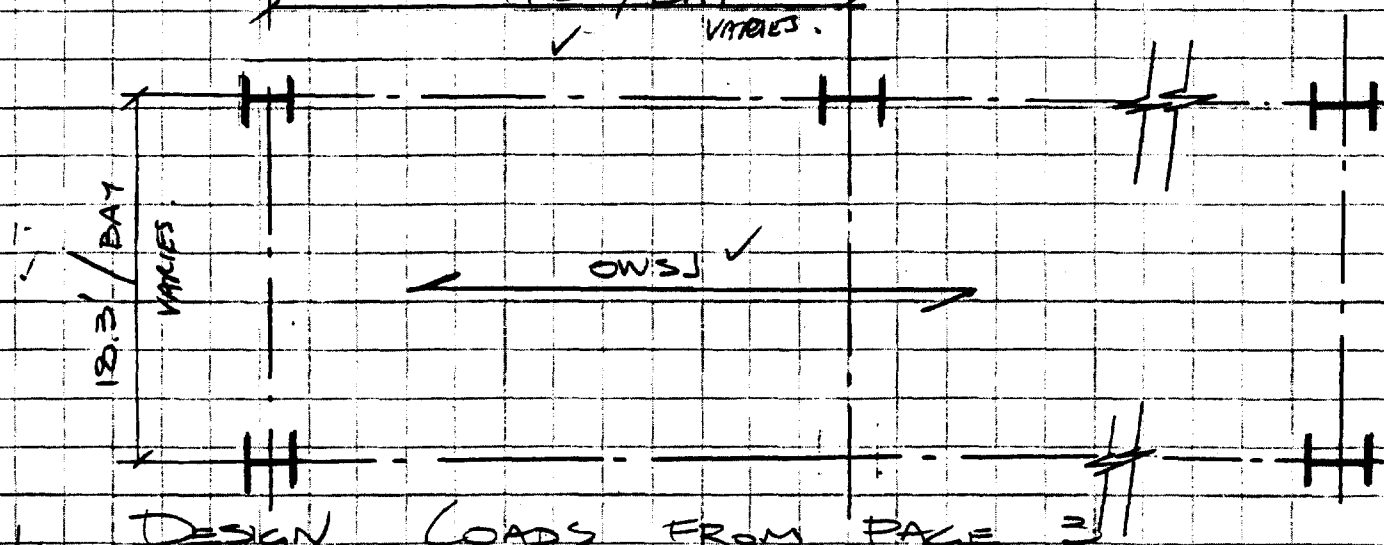
STEEL DESIGN ACCORDING TO AISC LOAD &
RESISTANCE FACTOR DESIGN

DESIGN RIGID ROOF DIAPHRAGM
& BRACED FRAME FOR BUILDING

55' x 53' & TO &

17.3' / BAY

VARIES.



DESIGN LOADS FROM PAGE 3

a) DEAD LOAD

STEEL DECK

VAPOR BARRIER

GYPSUM BOARD

ROOF MEMBRANE

RIGID INSULATION

TAR & CHIP

14.0 psf (*) ✓

(*) TO BE CONFIRMED ✓

b) SNOW LOAD

GROUND SNOW LOADS

$$P_f = C_e I P_g$$

111.1.4 (OBBC)

$$P_g = 25 \text{ psf} \checkmark (111.1.2 (4101:2-11-11))$$

NOTE: LARGER LOAD

THE BOCA FIG. 111.1.2c

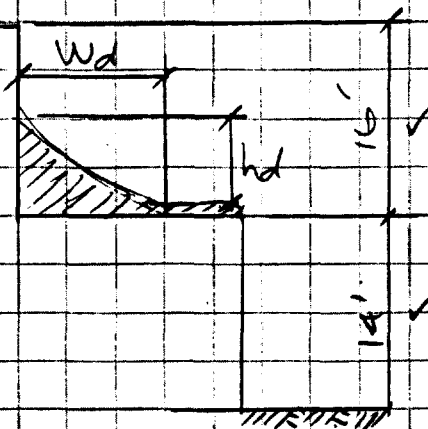
C_e = 0.7, I = 1.0

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 2372-10PROJECT NAME: SUMMITNAT'LDATE: OCT. 1 / 92DESIGNED BY: PDCHECKED BY: IMP 7PAGE 8 OF

$$P = 0.7(10) 25 \text{ psf}$$

$$= 17.5 \text{ psf} \checkmark$$

i) SNOW ACCUMULATION DUE TO DRIETING
(1117.1 OBBC / BOCA)



$$h_d = 0.43(W_b)^{1/3}(P_g + 10)^{1/4} - 1.5$$

$W_b = 55'$ (WIDTH OF HIGHER ROOF)

$$P_g = 25 \text{ psf} \checkmark$$

$$h_d = 0.43(55)^{1/3}(25 + 10)^{1/4} - 1.5$$

$$= 2.48' \checkmark$$

$$h_d \leq (h_r - h_b)$$

$$h_d \leq (16' - 14.5') \checkmark$$

$$h_d \leq 14.55' \checkmark$$

$$h_r = 16' \checkmark$$

$$D = 0.13 P_g + 14'$$

$$= 0.13(25 \text{ psf}) + 14'$$

$$= 17.25 \text{ lb/ft}^2 \checkmark$$

$$h_b = 25 \text{ lb/ft}^2 / 17.25 \text{ lb/ft}^2$$

$$= 1.45 \text{ ft} \checkmark$$

WIDTH OF DRIET W_d

SMALLER OF; $W_d = 4 h_d \checkmark$ or $W_d = 4(h_r - h_b) \checkmark$

$$W_d = 4(2.48') \checkmark \text{ or } W_d = 4(14.55') \checkmark$$

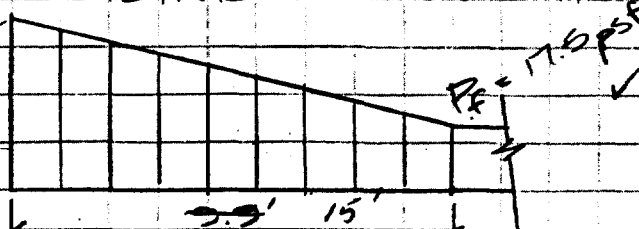
$$= 9.91' \checkmark \text{ or } = 58.2'$$

THE SNOW DISTRIBUTION ON THE LOWER ROOFS ARE

$$P_g' = 17.25 \text{ lb/ft}^2 (2.48')$$

$$= 42.78 \text{ psf}$$

$$(67) P_g' = 42.8 \text{ psf}$$



IMP 7

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 2372-10PROJECT NAME: SUMMITNATIONALDATE: OCT 7/92DESIGNED BY: PDCHECKED BY: MM 2PAGE 9 OF

DESIGN ROOF DECK FOR DEAD & LIVE LOADING

LOADS

i) DEAD LOAD
DL = 14 psf ✓

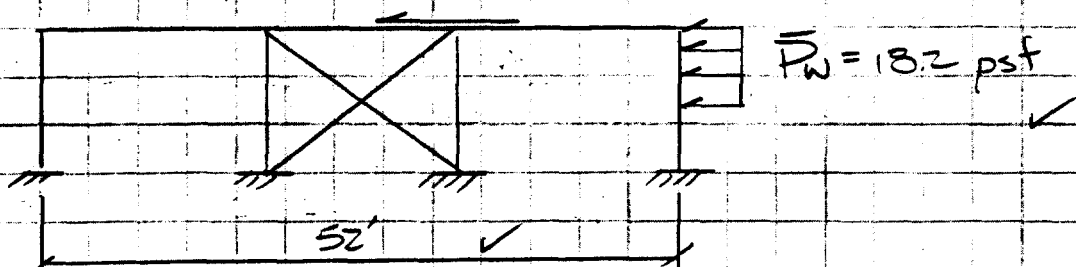
ii) LIVE LOAD
- SNOW LOAD S.L. = 17.5 psf ✓
- WIND LOAD W.L. = 16.8 psf.

ONSU SPAN 52'-0" @ 6'-0" O.C. ✓
STEEL DECK DESIGN FROM WESTEEL-ROSCO
LTD., GRADE A STEEL $F_y = 33,000$ psi,
WORKING STRESS $F_a = 20,625$ psi

$\frac{A}{A} \quad \frac{A}{A} \quad \frac{A}{A} \quad \frac{A}{A} \quad \frac{A}{A}$ 3 EQUAL SPAN
@ 6'-0" / SPAN ✓

CHOOSE T-15 ROOF DECK, THICKNESS
(0.030 in) TOTAL LOADING FOR ALLOWABLE
STRESS $P_a = 97$ psf

$$\begin{aligned} A &= 0.495 \text{ in}^2 \\ S_x &= 0.206 \text{ in}^3 \\ I_x &= 0.178 \text{ in}^4 \end{aligned}$$

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 2372-10PROJECT NAME: SUMMITNAT'LDATE: 08-1-92DESIGNED BY: P.D.CHECKED BY: Wm?PAGE 10 OF 

RIGID ROOF DIAPHRAGM DESIGN 18.2 psf ✓

(ALLOWABLE STRESS METHOD)

1. TOTAL WIND FORCES
TO BE CARRIED BY
ROOF DIAPHRAGM ✓

$$\begin{aligned}
 \bar{P}_w &= [18.5 \text{ psf (10 ft)} \checkmark \quad 55' \checkmark \\
 &\quad + 17.5 \text{ psf (5 ft)}] / 15 \text{ ft} \\
 &\quad \text{AVERAGE} \quad \text{ON} \\
 &= 18.2 \text{ psf} \checkmark
 \end{aligned}$$

$$\begin{aligned}
 W &= \frac{33}{2} \times 18.2 \\
 &= 300 \text{ #/ft} \checkmark
 \end{aligned}$$

18.2 psf ✓

- 2) MAXIMUM DIAPHRAGM
SHEAR, q , WITH DIAPHRAGM
SPANNING BETWEEN END WALLS ✓

$$q = \frac{WL}{2D}$$

$$\begin{aligned}
 W &= 18.2 \text{ psf} \left(\frac{30 \text{ ft}}{2} \right) \\
 &= 273 \text{ lb/ft} \quad 300
 \end{aligned}$$

$$\begin{aligned}
 q &= \frac{273 \text{ lb/ft} (55 \text{ ft})}{2 (52 \text{ ft})} \checkmark \\
 &= 144 \text{ lb/ft} \quad 158
 \end{aligned}$$

$$\begin{aligned}
 L &= 55 \text{ ft} \checkmark \\
 D &= 52 \text{ ft} \checkmark
 \end{aligned}$$

- i) CHOOSE $1\frac{1}{2}$ " DECK, 22 ga, 6'-0" SPAN
FOR DECK, USING 3 TRANSVERSE
WELDS/UNIT & SIDE LAP BUTION ✓

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 2372-10PROJECT NAME: SummitNATIONALDATE: Oct 2/92DESIGNED BY: P.D.CHECKED BY: MM7PAGE 11 OF

PUNCHED @ 24" O.C. ✓
 FROM TABLE II, "CANADIAN SHEET
 STEEL BUILDING INSTITUTE DIAPHRAGM
 ACTION OF CELLULAR STEEL FLOOR
 & ROOF DECK CONSTRUCTION ✓

ALLOWABLE DIAPHRAGM SHEAR
 $q = 240 \text{ lb/ft} > 144 \text{ lb/ft}$ ✓
 158 ✓

ii) LONGITUDINAL WELD SPACING FACTORS, q_w

DECK GAUGE - 22 ga ✓
 $\psi = 1380$ (TABLE IV CSSBI) ✓

$q_w = \frac{1380 \text{ lb}}{144 \text{ lb/ft}} = 9.6 \text{ ft}$ ✓
 158 8.7

HOWEVER SPACING $\leq 4 \text{ ft}$

$\therefore q_w = 4 \text{ ft}$ ✓

iii) SELECT A TRIAL PERIMETER
 MEMBER FOR DECK.

TRY $L 3" \times 3" \times 3/16$ CONTINUOUS ✓

$A = 1.09 \text{ in}^2$, $r = 0.94 \text{ in}$, $S = 0.44 \text{ in}^3$ ✓

AXIAL STRESS DUE TO DIAPHRAGM
 FLEXURE (IF LOADS ON DECK)

$M = \frac{WL^2}{8}$ ✓ ; $M = \frac{273 \text{ lb/ft} (55 \text{ ft})^2}{8}$ ✓
 113 8
 $= 103.2 \text{ ft} \cdot \text{k}$ ✓

$F_a = \frac{M}{D}$; $F_a = \frac{103230 \text{ ft} \cdot \text{lb}}{52 \text{ ft}}$ ✓

$= 1985 \text{ lb}$ ✓ 2172

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 23T-10PROJECT NAME: SUMMITNAT'LDATE: OCT 2/92DESIGNED BY: P.D.CHECKED BY: Wm 7PAGE 1V OF

$$f_a = \frac{P_a}{A} ; f_a = \frac{1985 \text{ lb}}{1.09 \text{ in}^2} \checkmark$$

$$= 1821 \text{ psi} \checkmark \quad (\text{AXIAL STRESS})$$

LOCAL BENDING STRESS FROM WIND LOAD ACTING ON UNSUPPORTED LENGTH OF 6'0" (10' BETWEEN ONES) ✓

ASSUME TWO PERIMETER MEMBERS TRANSVERSE TO WIND DIRECTION TAKE 1/2 THE TOTAL LATERAL LOAD ON DIAPHRAGM ✓

LAND VIEW
ROOF



$$W_1 = \frac{1}{2} W_2$$

$$W_1 = \frac{1}{2} (273 \text{ lb/ft}) \checkmark$$

$$= 136.5 \text{ lb/ft} \quad 150 \checkmark$$

$$M_1 = \frac{136.5 \text{ lb/ft} (6 \text{ ft})^2}{10} \checkmark \quad (\text{CONTINUOUS MEMBER})$$

$$= 491 \text{ ft} \cdot \text{lb} \checkmark$$

$$f_b = \frac{491 \text{ ft} \cdot \text{lb} \times 12 \text{ in}}{0.44 \text{ in}^3} \checkmark$$

$$= 13402 \text{ psi} \quad 14777 \quad (\text{FLEXURAL STRESS})$$

$$\frac{KL}{r} = \frac{10 (60 \text{ ft}) 12 \text{ in}}{0.94 \text{ in}} = 76.5 ; C_0 \sqrt{\frac{2 \pi E}{F_y}} = 126$$

CHECK COMBINED STRESS

$$\frac{f_a}{F_a} + \frac{f_b}{F_b}$$

$$f_a = 1821 \text{ psi} \quad 1996 \checkmark$$

$$f_b = 13402 \text{ psi} \quad 14777 \checkmark$$

$$F_a = 0.48 (36,000) = 17,280 \checkmark$$

$$F_b = 0.6 F_y \quad (\text{ALLOWABLE STRESS FOR ANGLE})$$

$$= 0.6 (36,000 \text{ psi})$$

$$= 21,600 \text{ psi} \checkmark$$

A36. ✓

WHERE

$$F_a = \left[1 - \frac{(KL/r)^2}{2 C_0} \right] F_y / F_s$$

$$= 0.48 F_y \checkmark$$

$$F_s = \frac{5}{3} + \frac{3 (KL/r)^2}{8 C_0} = \frac{(KL/r)^2}{8 C_0} = 1.7$$

$$\frac{1821 \checkmark}{17,280} + \frac{13,402 \checkmark}{21,600} = 0.78 < 1.0 \text{ OK} \checkmark$$

$$17,280 \quad 21,600$$

105
672
102

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 2372-10PROJECT NAME: SUMMITNATIONALDATE: OCT. 2DESIGNED BY: P.D.CHECKED BY: WmPAGE 13 OF

CHECK TOTAL DEFLECTION OF DIAPHRAGM
 L 1/240

$$\Delta_T = \Delta_F + \Delta_W \quad \checkmark$$

i) FLEXURAL DEFLECTION, Δ_F

$$\Delta_F = \frac{5WL^4}{384EI} (12)^3 \quad \checkmark$$

SIMPLE SPAN
FOR ROOF DIAPHRAGM

$$W = \text{UNIFORM LATERAL LOADING}$$

$$= 273 \text{ lb/ft } 300$$

$$L = \text{SPAN SIMPLE BEAM}$$

$$= 55 \text{ ft } (12 \text{ in}) = 660$$

$$E = 29,000 \text{ ksi } \checkmark$$

I_x = MOMENT OF INERTIA
OF DIAPHRAGM FLANGE
ABOUT CENTROIDAL
AXIS OF DIAPHRAGM \checkmark

$$I = I_x + Ad^2$$

$$I_x = [0.96 \text{ in}^4 + 1.09 \text{ in}^2 \left(\frac{52 \text{ ft } (12 \text{ in})}{2} \right)^2] \checkmark$$

$$= 212,209 \text{ in}^4 \quad \checkmark$$

$$\Delta_F = \frac{5(273 \text{ lb/ft } (12 \text{ in}) (660 \text{ in})^4}{384 (29,000,000) 212,209 \text{ in}^4} \quad \checkmark$$

$$= 0.009 \text{ in } 0.010 \quad \checkmark$$

ii) WEB DEFLECTION, Δ_W

$$\Delta_W = \frac{VL^3 F}{2 \times 10^6} \quad \checkmark$$

$$V = \text{AVERAGE SHEAR ALONG LENGTH}$$

$$= 144 \text{ lb/ft } 150$$

$$F = 23.2 + 185R \text{ Table III}$$

$$= 23.2 + 185/3 \quad \checkmark$$

$$= 849 \times 10^6 \text{ in/lb } \checkmark$$

$$L = 660 \text{ in } \checkmark$$

$$F = \text{FLEXIBILITY FACTOR}$$

$$R = \text{RATIO OF DECK SPAN TO AVG LENGTH}$$

$$\Delta_W = \frac{(144 \text{ lb/ft } (12 \text{ in}) 660 \text{ in } (849 \text{ in/lb}))}{2 \times 10^6} \quad \checkmark$$

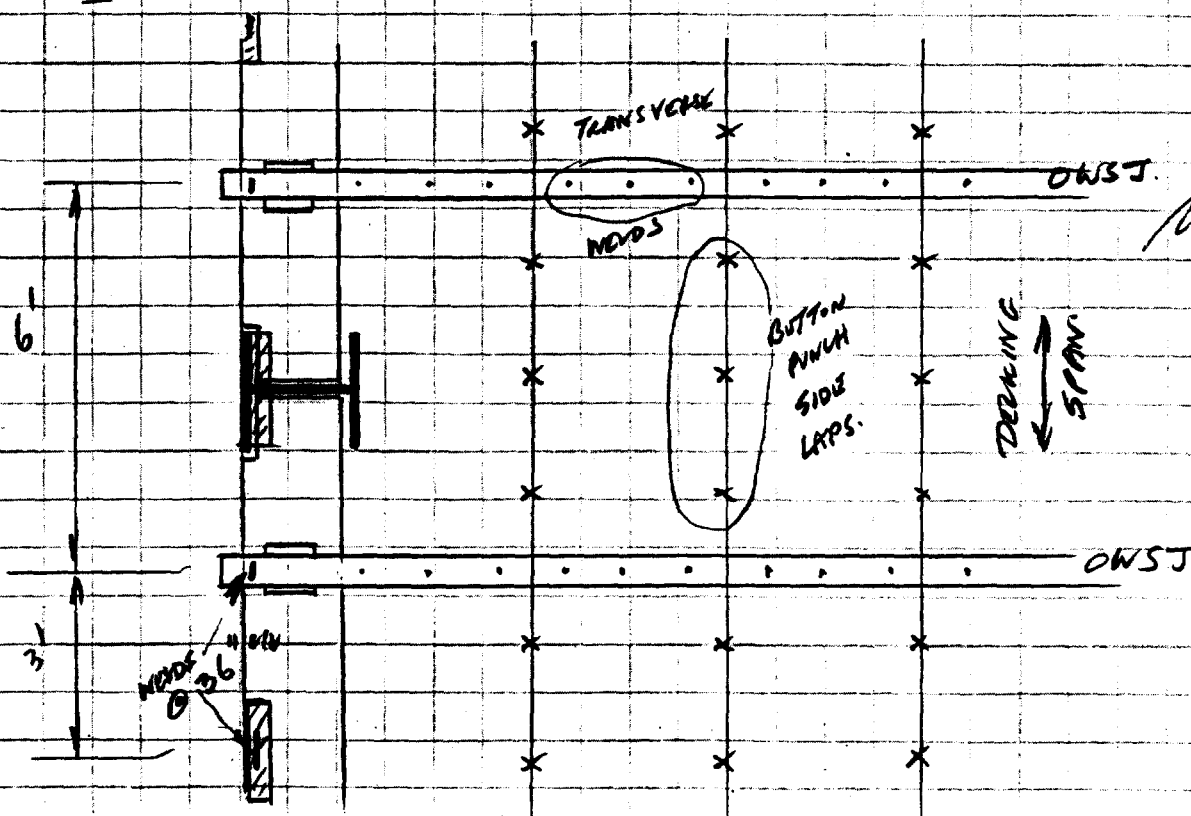
$$= 1/3 = 0.33 \quad \checkmark$$

$$= 0.336 \text{ in } 0.350 \quad \checkmark$$

$\Delta L = l/240 = 220 \text{ in} / 240$
 $\Delta L = 0.92 \text{ in}$
 $\Delta_T = 0.009 \text{ in} + 0.336 \text{ in}$
 $\Delta_T = 0.345 \text{ in} < 0.92 \text{ in} \quad \text{OK} \checkmark$

SUMMARY

- $1\frac{1}{2}$ " STEEL DECK, 22 ga. 3 SPAN X
- @ 6'-0"
- NO TRANSVERSE WELDS / DECK UNIT = 3 X
- SIDE LAP CONNECTION - BUTT PUNCH
- @ 24 in O.C. X 36 ✓
- LONGITUDINAL WELD SPACING - ~~28~~ in ✓
- PERIMETER FRAMING MEMBER @ EDGE OF ROOF
- $\angle 3" \times 3" \times \frac{3}{16}$ CONTINUOUS ✓



CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10

PROJECT NAME: SUMMIT

NATIONAL

DATE: OCT 1/92

DESIGNED BY: P.D.

CHECKED BY: [Signature]

PAGE 15 OF

COL. DESIGN

WIND LOADS

$$P_d = P_e I^* C_p$$

1112.3 OBBC

BASE WIND SPEED - 80 mph ✓

1112.32 (9101.02 - 11.12) ✓

EXPOSURE - C (OPEN TERRAIN)

0'-20' 17.5 psf ✓

20'-30' 18.5 psf ✓

DESIGN TYPICAL COLUMN AT END WALLS
BETWEEN COLUMN LINES B-H & I-S (TYPICAL)ASTM - A36 STEEL, $F_y = 36 \text{ ksi}$, $\phi_c = 0.85$, $\phi_t = 0.9$ ✓

(i) 1.2 D.L. + 1.6 L.L. (AISC, LRFD) ✓

AXIAL LOAD ON COLUMN

$$K_L = 34' ; P = 183 \text{ ft} \left(\frac{52 \text{ ft}}{2} \right) \left[14 \text{ psf} (1.2) + 17.5 \text{ psf} (1.6) \right]$$
$$= 21.3 \text{ k} \checkmark$$

(ii) MOMENT DUE TO WIND LOADING

$$M_F = 1.6 (18 \text{ psf}) (18.3 \text{ ft}) (34 \text{ ft})^2 / 8$$
$$= 76.16 \text{ ft.k} \checkmark$$

CHOOSE W10x49 ✓

 $\phi P_n = 119 \text{ k} @ 34' \checkmark$ $A_g = 14.4 \text{ in}^2 \checkmark$ $I_x = 272 \text{ in}^4 \checkmark$ $L_p = 10.6 \text{ ft} \checkmark$ $I_y = 93.4 \text{ in}^4 \checkmark$ SECTION IS NON COMPACT $r_x = 4.38 \text{ in} \checkmark$ $r_y = 2.54 \text{ in} \checkmark$

(iii) CHECK INTERACTION EQ'N

$$\frac{P_u}{\phi P_n} = \frac{21.3 \text{ k}}{119 \text{ k}} = 0.179 < 0.2$$

HOWEVER USE
(EQ'N H1-1a) ✓

GUIDE . p. 36.

$$(H1-1a) \frac{P_u}{\phi P_n} + \frac{8}{9} \left(\frac{M_{ux}}{\phi_b M_{nx}} + \frac{M_{uy}}{\phi_b M_{ny}} \right) \leq 1.0 \checkmark$$

[Signature]

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT NO.: 7377-10PROJECT NAME: SMALLNATIONALDATE: OCT 1/92DESIGNED BY: P.D.CHECKED BY: mm?PAGE 16 OF

MSC P. 648

WHERE $N_u = B_1 M_n + B_2 M_p$ ✓

M_n - REQ'D FLEXURAL STRENGTH IN
MEMBER ASSUMING NO LATERAL
TRANSLATION OF FRAME (in k) ✓

M_p - REQ'D FLEXURAL STRENGTH IN
MEMBER AS A RESULT OF LATERAL
TRANSLATION OF THE FRAME ONLY (in k) ✓

$$(H1-3) B_1 = C_m / (1 - P_u / P_e) \geq 1.0 \quad \checkmark$$

WHERE $P_e = A_g F_c / \lambda_c^2$ ✓

$$(H1-4) C_m = 0.6 - 0.4 (M_1 / M_2) \quad \checkmark$$

M_1 / M_2 - RATIO SMALLER
MOMENT TO
LARGER MOMENT

$$B_2 = \frac{1}{1 - \frac{\sum P_u}{\sum P_e}} \quad \checkmark$$

(SECONDARY EFFECT OF P-Δ)

CALCULATE COLUMN SLENDERNESS PARAMETER
 λ_c IN THE PLANE OF BENDING

ABOUT xx $\lambda_{cx} = \frac{K L}{r_x \pi} \sqrt{\frac{F_y}{E}}$ 16-39.

(E2-4)

$$\lambda_{cx} = \frac{34 \text{ ft} (12 \text{ in})}{(4.38 \text{ in}) \pi} \sqrt{\frac{36 \text{ ksi}}{29,000 \text{ ksi}}} \quad \checkmark \quad (1.035)$$

$$\lambda_{cx} = 1.04 \quad \checkmark$$

ABOUT yy $\lambda_{cy} = \frac{34 \text{ ft} (12 \text{ in})}{(2.54 \text{ in}) \pi} \sqrt{\frac{36 \text{ ksi}}{29,000 \text{ ksi}}} = 1.80 \quad \checkmark$

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 2372-10PROJECT NAME: SUMMITNATIONALDATE: OCT 6/92DESIGNED BY: P.D.CHECKED BY: mm7PAGE 17 OF

$$P_{ex} = A_g F_y / \lambda_c^2 \checkmark; P_{ex} = 14.4 \text{ in}^2 (36 \text{ ksi}) / (1.04)^2 \checkmark$$

$$= 479 \text{ k} \checkmark$$

$$P_{ey} = 14.4 \text{ in}^2 (36 \text{ ksi}) / (1.80)^2 \checkmark = 160 \text{ k} \checkmark$$

$$(H1-4) C_m = 0.6 - 0.4 \left(\frac{M_1}{M_2} \right) \checkmark \quad \text{BASE OF COLUMN}$$

$$C_m = 0.6 \checkmark \quad \text{PIN CONNECTED}$$

$$M_1 = 0 \checkmark$$

$$(H1-3) B_{1x} = C_m / [1 - P_u / P_c] \geq 1; B_{1x} = 0.6 / [1 - (14.2 / 479)] \checkmark \quad (21.3) \quad .956$$

$$B_{1x} = 0.62; \text{USE } B_{1x} = 1.0 \checkmark$$

$$B_{1y} = 0.6 / [1 - (14.2 / 160)] \checkmark \quad (11.3) \quad .847$$

$$= 0.66; \text{USE } B_{1y} = 1.0 \checkmark$$

ANALYSIS OF SECONDARY EFFECTS (P.A)

$$(H1-6) B_2 = \frac{1}{1 - \frac{\sum P_u}{\sum P_c}} \checkmark \quad \sum P_u = \text{AXIAL LOAD ON ALL COLUMNS}$$

$$\sum P_c = \sum A_g F_y / \lambda_c^2 \checkmark$$

$$\sum P_u = [1.2 (14 \text{ psf}) + 1.6 (17.5 \text{ psf})] 55 \text{ ft} (52 \text{ ft})$$

$$= 128.1 \text{ k} \checkmark$$

$$\sum P_{ex} = 13 \text{ col} (479 \text{ k} / \text{col})$$

$$= 6,227 \text{ k} \checkmark$$

$$\sum P_{ey} = 13 \text{ col} (160 \text{ k} / \text{col})$$

$$= 2,080 \text{ k} \checkmark$$

mm

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 2372-10PROJECT NAME: SUMMITNATIONALDATE: OCT 6/92DESIGNED BY: PDCHECKED BY: MM7PAGE 18 OF

$$B_2 = 1 / (1 - \sum P_u / \sum P_{e_x}) \leq 1.0$$

$$= 1 / [1 - 1281k / 6227k] \checkmark$$

$$= 1.02 \checkmark$$

$$B_2 = 1 / (1 - \sum P_u / \sum P_{e_y}) \leq 1.0$$

$$= 1 / [1 - 128 / 2080] \checkmark$$

$$= 1.07 \checkmark$$

$$M_n = 21.3 k \left(\frac{4 \text{ in}}{12 \text{ in}} \right)$$

$$= 7.1 \text{ ft.k} \checkmark$$

ASSUME 4" ECCENTRICITY

$$M_y = 76.2 \text{ ft.k}$$

$$M_{ux} = 1.0 \left(\frac{7.1 \text{ ft.k}}{B_1} \right) + 1.0 \left(\frac{76.2 \text{ ft.k}}{B_1} \right) \checkmark$$

$$= 83.3 \text{ ft.k} \checkmark$$

$$\begin{aligned} \phi_b M_{ux} &= \phi_b F_y Z_x \\ &= 0.9 (36 \text{ ksi}) (60.4 \text{ in}^3 / 12 \text{ in}) \\ &= 163.1 \text{ ft.k} \checkmark \end{aligned}$$

$$(111-1a) \cdot \frac{P_u}{\phi P_n} + \frac{8}{9} \left(\frac{M_{ux}}{\phi_b M_{ux}} + \frac{M_{uy}}{\phi_b M_{uy}} \right) \leq 1.0 \checkmark$$

$$\frac{21.3 \checkmark k}{119 \checkmark k} + \frac{8 \checkmark}{9 \checkmark} \left(\frac{83.3}{163.1} \right) = 0.633 \leq 1.0 \text{ OK.} \checkmark$$

0.179

.454

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No: 2372-10PROJECT NAME: SummitNATIONALDATE: OCT 6/92DESIGNED BY: P.D.CHECKED BY: mm 7.PAGE 19 OF

CHECK DEFLECTION $\Delta \leq l/240$ ✓

$w = 18 \text{ psf} (10.3 \text{ ft}) = 329 \text{ lb/ft}$ ✓

$I_x = (240) \frac{5 \sqrt{329 \text{ lb/ft} (12 \text{ in}) (34 \text{ ft} (12 \text{ in}))^3}{384 \times 29 \times 10^6 \text{ psi}}$ ✓

$= 201 \text{ in}^4 \checkmark \leq I_x = 272 \text{ in}^4 \text{ OK.}$ ✓

USE W10x49

✓

$\frac{8}{240} = \frac{5 \sqrt{329 \text{ lb/ft} (12 \text{ in})^3}{384 \times 29 \times 10^6 \text{ psi}}$

$\frac{1}{240} = \frac{5 \sqrt{329 \text{ lb/ft} (12 \text{ in})^3}{384 \times 29 \times 10^6 \text{ psi}}$

$I = \frac{240 \times 5 \sqrt{329 \text{ lb/ft} (12 \text{ in})^3}{384 \times 29 \times 10^6 \text{ psi}}$

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 2372-10PROJECT NAME: SummitNATIONALDATE: OCT. 5/92DESIGNED BY: PDCHECKED BY: MMPAGE 20 OF

1. EAVE BEAM DESIGN ALONG COLUMN LINE B, H (TYPICAL BEAM)

AXIAL LOAD FROM DIAPHRAGM

$$P_f = 182 \text{ psf} (1.6) \left[\frac{52 \text{ ft}}{2} \left(\frac{34 \text{ ft}}{2} \right) \right] = 11.4 \text{ k.}$$

BENDING MOMENT

$$M_f = \left[12 (14.0 \text{ psf}) + 16 (17.5 \text{ psf}) \right] \frac{52 \text{ ft}}{2} = 1,164 \text{ lb/ft}$$

$$M_f = \frac{1,164 \text{ lb/ft} (21.0 \text{ ft})^2}{8} ; l = 21.0 \text{ MAX SPAN} = 64.2 \text{ ft.k.}$$

CHECK INTERACTION OF AXIAL LOAD & BENDING MOMENT FOR W8x31

INCLUDE TORSION LOADING DUE TO DEAD LOAD ON EAVE BEAM

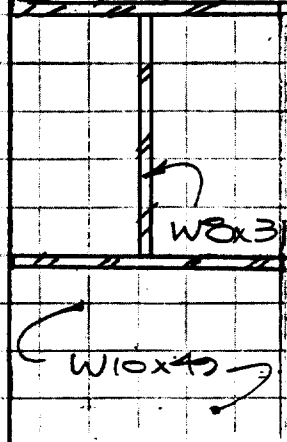
$$P_f = 184 \text{ lb/ft}$$

$$P_f = 4.5 \text{ psf} (1.2) 34 \text{ ft} = 184 \text{ lb/ft}$$

TRANSVERSE BENDING IN BEAM FLANGE DUE TO TORSION

$$M_f = P_f l = 184 \text{ lb/ft/ft} \left(\frac{4 \text{ in}}{12 \text{ in}} \right) = 61.2 \text{ ft.lb/ft}$$

$$M_f = 61.2 \text{ ft.lb/ft} (21.0 \text{ ft}) = 1.30 \text{ ft.k.}$$



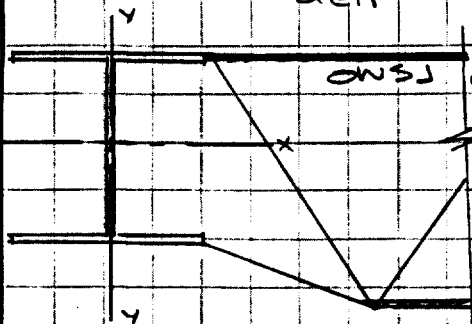
CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 7372-10PROJECT NAME: SUMMITNATIONALDATE: OCT 5/92DESIGNED BY: P.D.CHECKED BY: WmPAGE 21 OF

CHECK INTERACTION OF AXIAL LOADS & MOMENTS ON EAVE BEAM W8x31

COMPRESSION EFFECTIVE LENGTH $KL = 21.0$ $\phi_c P_n = 140$ k

$$P_{u,eff} = P_u + M_{u_x} M + M_{u_y} M U ; L_b = 6'-0"$$

BRACE BOTTOM FLANGE W. OWSJ EXTEN



OWSJ @ 6'-0" OK

$$P_u = 11.4 \text{ k}$$

$$M_{u_x} = 64.2 \text{ ft}\cdot\text{k}$$

$$M_{u_y} = 1.3 \text{ ft}\cdot\text{k}$$

CONFIRM W8x31 IS ADEQUATE

$$P_{u,eff} = 11.4 \text{ k} + 48.0 (-4) + 1.12 (2.4) 1.41$$

$$= 132.3 \text{ k}$$

SELECT W8x31

$$\phi_c P_n = 140 \text{ k @ } 21'$$

WHERE $M = 2.4$ (TABLE B.9.2)

$$U = 1.41$$

AISC

CHECK W8x31

$$A = 14.4 \text{ in}^2$$

$$I_y = 110 \text{ in}^4$$

$$I_x = 37.1 \text{ in}^4$$

$$C_p = 8.4 \text{ ft (AISC pg 2-27)}$$

$$r_y = 2.02 \text{ in}$$

$$r_x = 3.47 \text{ in}$$

$$Z_x = 30.4 \text{ in}^3$$

SINCE $C_p < L_b$ SECTION IS COMPACT SECTION

BRACE BOTTOM FLANGE W. OWSJ EXTENSION

$$\frac{P_u}{\phi_c P_n} = \frac{11.4 \text{ k}}{140 \text{ k}} = 0.08 < 0.2$$

FORMULA H1-16 APPLIES

$$\phi_b M_{u_x} = 0.9 (36 \text{ ksi}) 30.4 \text{ in}^3 / (12 \text{ in})$$

$$= 82.08 \text{ ft}\cdot\text{k}$$

$$\frac{11.4 \text{ k}}{2(140 \text{ k})} + \frac{64.2 \text{ ft}\cdot\text{k}}{82.1 \text{ ft}\cdot\text{k}} = 0.83 < 1.0 \text{ OK}$$

CHECK LATERAL TORSION ON BEAM

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 2372-10PROJECT NAME: SUMMITNATIONALDATE: OCT 13/92DESIGNED BY: P.D.CHECKED BY: Wm?PAGE 22 OF

NOTE: DECK & GWSJ BRACE THE
TOP FLANGE CHECK WELDS ARE
ADEQUATE REFER TO CONNECTIONS
CALCULATIONS

CHECK DEFLECTION OF BEAM $\Delta \leq l/240$

$$l = 21 \text{ ft } (12 \text{ in}) = 252 \text{ in}$$

$$W = 17.5 \text{ psf } \left(\frac{52 \text{ ft}}{2} \right) = 455 \text{ lb/ft}$$

$$I_x = 240 \left(\frac{5}{384} \right) \frac{(455 \text{ lb/ft } / 12 \text{ in}) (252 \text{ in})^3}{29 \times 10^6 \text{ psi}}$$

$$= 65.9 \text{ in}^4 < 110 \text{ in}^4 \quad \text{OK}$$

USE W8x31 AS PERIMETER BEAM

USE W8x35, COMPROT SECTION

SEE DESIGN CHECK PAGE . 26.

✓
Wm

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10
 PROJECT NAME: SUMMIT NAT.
STRUCTURAL
 DATE: DEC. 9/92.

DESIGNED BY: NM7

CHECKED BY: _____

PAGE 23 OF _____COL. DESIGN CHECK

(BY WORKING STRESS METHOD)

SEE P 78 →
15.

PSD'S DESIGN.

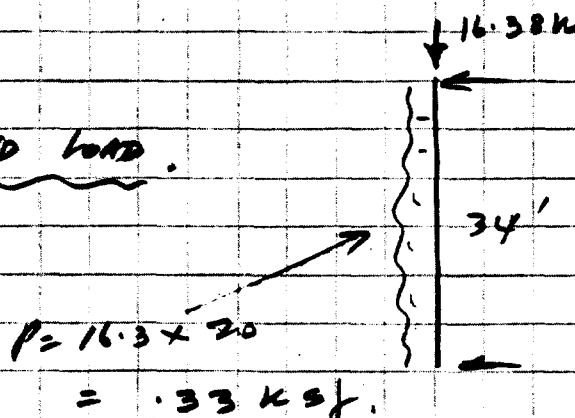
MAX LOAD @ H 4

$$\text{LOAD} = \frac{52'}{2} \times 20' \times 31.5 \text{ psf}$$

$$= 16.38 \text{ K}$$

LOAD
 14 psf DEBRIS
 17.5 psf SNOW
31.5 psf.

CHECK A36 10x8 x 39 #

@ 34' L. $P = < 46 \text{ K}$ TRY 10x10x49 $P = 83 \text{ K @ 34'}$ WIND LOAD.

$$M = \frac{.33 \times 34^2}{8} = 47.7 \text{ K-ft}$$

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No: 2372-10
 PROJECT NAME: SUMMIT NAT.
STRUCTURAL
 DATE: Oct 9/92

DESIGNED BY: WJ7

CHECKED BY: _____

PAGE 24 OF _____STRENGTH CHECK

$$\frac{f_a}{0.6 F_y} + \frac{f_b}{F_b} \leq 1.0$$

$$f_a = \frac{16.38}{3.4} = 4.82 \text{ ksi} \quad F_y = 36$$

$$f_b = \frac{16.38 \times 12}{54.6} = 3.6 \text{ ksi} \quad F_b = 0.75 \times 36 = 27 \text{ ksi}$$

$$\therefore \frac{4.82}{21.6} + \frac{3.6}{27} = \frac{0.223}{0.133} = 0.356 \ll 1.0 \checkmark$$

STABILITY CHECK

$$\frac{f_a}{F_a} + \frac{F'_b}{F_b} \leq 1.0$$

$$f_a = 4.82$$

$$F_a \text{ Table 4-1}$$

$$(F_{sc}) F_a = 13.8 \text{ ksi}$$

$$(F_y) F_a = 5.82 \text{ ksi}$$

$$\alpha_x = \frac{1}{1 - \frac{4.82}{13.8}} = \frac{1}{0.715} = 1.399$$

$$\alpha_y = \frac{1}{1 - \frac{4.82}{5.82}} = \frac{1}{0.172} = 5.814$$

$$f'_b = \frac{C_m M}{S} = \frac{1 \times 16.38 \times 12}{54.6} \quad C_m \text{ Table 4-1} = 1.0 \text{ (max)}$$

$$F_b = 0.66 F_y = 23.76$$

$$\frac{KL}{r_y} = \frac{1 \times 34 \times 12}{4.35} = 94$$

$$F_y = \frac{1 \times 34 \times 12}{2.54} = 160$$

$$F'_c =$$

$$\text{Table 4-16}$$

$$(F_{sc}) F'_c = 16.9$$

$$(F_y) F'_c = 5.82$$

CRA**CONESTOGA-ROVERS & ASSOCIATES**

PROJECT No.: 2372-10
 PROJECT NAME: SUMMIT NAT.
STRUCTURAL
 DATE: OCT. 9/92.

DESIGNED BY: NM7

CHECKED BY: _____

PAGE 25 OF _____

(76) $\therefore \frac{4.82}{13.8} + \frac{3.6}{23.76} \times 1.399 = 0.34 + 0.21$
 $= 0.55 < 1.0$

(77) $\therefore \frac{4.82}{5.82} + \frac{10.57}{54.6} \times 5.812 = 0.828 + 1.126$
 $= 1.954 > 1.0$

$P = 16.38 \text{ k} = 22\% \text{ OF } P_{AN} (73.4) \text{ k}$

Design as beam $M_R = 10.9 \text{ k}' >> 47.7$

$L_{CR} = 23.3$

GIRTS WILL PROVIDE LATERAL SUPPORT

GIRTS PREVENT BENDING IN Y. DIRECTION.

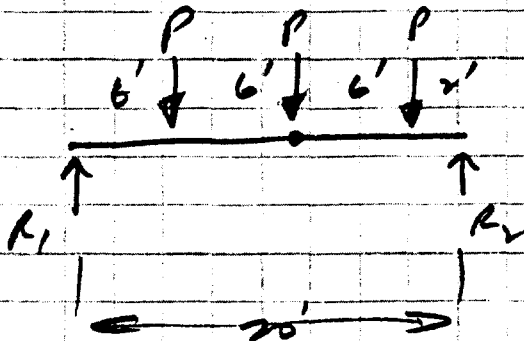
$\therefore \text{OK}$

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 2372-10PROJECT NAME: SUMMIT. NAT.
STRUCTURALDATE: 007.9/92.DESIGNED BY: WM 7.

CHECKED BY: _____

PAGE 26 OF _____EAVE BEAM

Line B 4-5.



$$P = 6 \times 52 \frac{1}{4} + 71.5 \text{ psf}$$

$$= 491 \text{ lb}$$

$$\begin{array}{rcl} M_{R1} & 491 \times 6 & = 2946 \\ & 491 \times 12 & = 5892 \\ & 491 \times 18 & = 8838 \\ \hline & 1473 & \end{array} \quad \begin{array}{rcl} & 2946 & \\ & 5892 & \\ & 8838 & \\ \hline & 17722 & \end{array}$$

$$R_2 = \frac{17722}{20} = 886 \text{ lb}$$

$$R_1 = 1473 - 886 = 587 \text{ lb}$$

$$\begin{aligned} \text{Max } M &= 8 \times 886 - 491 \times 6 \\ &= 7088 - 2946 = 4142 \text{ lb-ft} \end{aligned}$$

8 WF 35

$$M_R = 6212, \quad L_u = 20.3 \checkmark$$

(SEE P. 22)

See p 43, 44

FOR LOWER EAVE BEAM.

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 2372-10PROJECT NAME: SUMMITNATIONALDATE: OCT. 2/92DESIGNED BY: P.D.CHECKED BY: mm 7PAGE 27 OF **BRACED FRAME - WIND LOADS.****a) VERTICAL TENSION**

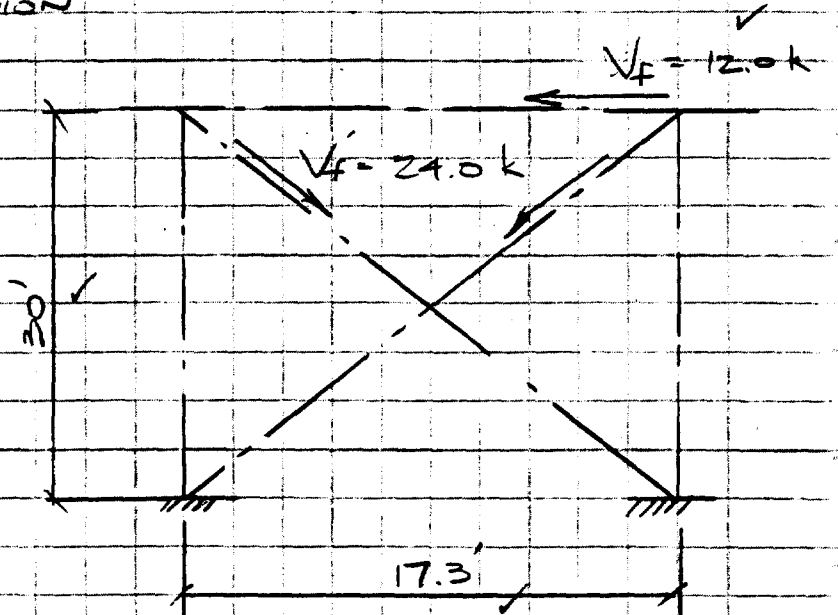
$$V_f = 16 (18.2 \text{ psf}) \checkmark \text{ P.10.}$$

$$\times \frac{55 \text{ ft}}{2} \left(\frac{30 \text{ ft}}{2} \right)$$

$$= 12,000 \text{ lb.} \checkmark$$

$$V_f' = 12.0 \text{ k} \left(\sqrt{\left(\frac{30}{17.3} \right)^2 + 1} \right) \checkmark$$

$$= 24.0 \text{ k.} \checkmark$$

**b) THE SIZE OF TENSION MEMBER REQ'D**

$$F_u = 36 \text{ ksi} \checkmark$$

i) ASSUME A325 BOLTS, $\frac{3}{4}$ " ϕ

$$B = 29.8 \text{ k} \quad (\text{TABLE 1-A pg 5.3 AISI})$$

$$\text{NO OF BOLTS REQ'D} = \frac{24}{29.8} = 0.8$$

USE 2- $\frac{3}{4}$ " BOLTS 3 MIN.**ii) FROM PRELIMINARY SELECTION TABLE**

$$T = \phi_t F_u A_n \quad \phi_t = 0.9$$

$$24 \text{ k} = 0.9 (36 \text{ ksi}) A_n$$

$$A_n = 0.74 \text{ in}^2$$

$$A_g = 0.442 \text{ in}^2$$

$$A_g = A_n + A_b$$

$$= 0.74 \text{ in}^2 + 0.44 \text{ in}^2$$

$$= 1.18 \text{ in}^2$$

CHOOSE $\angle 3 \times 3 \times \frac{1}{4}$ "

$$A = 1.44 \text{ in}^2 \checkmark \text{ OK}$$

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10

PROJECT NAME: SUMMIT
NATIONAL

DATE: 07/26/92

DESIGNED BY: WM7

CHECKED BY: _____

PAGE 78 OF _____

CHECK BRACING FOR EARTHQUAKE LOAD

BUILDING WEIGHT:

SEG P. 39.

DL ROOF 17.0 psf.

DL WALLS 7.0

TOTAL DL WALLS = $0.007 \times 33 \times 246 = 57 \text{ K.}$ " DL ROOF = $0.017 \times 55 \times 68 = 64 \text{ K}$ 121 K VERT.

5% EARTHQUAKE LOAD = 6 K HOR.

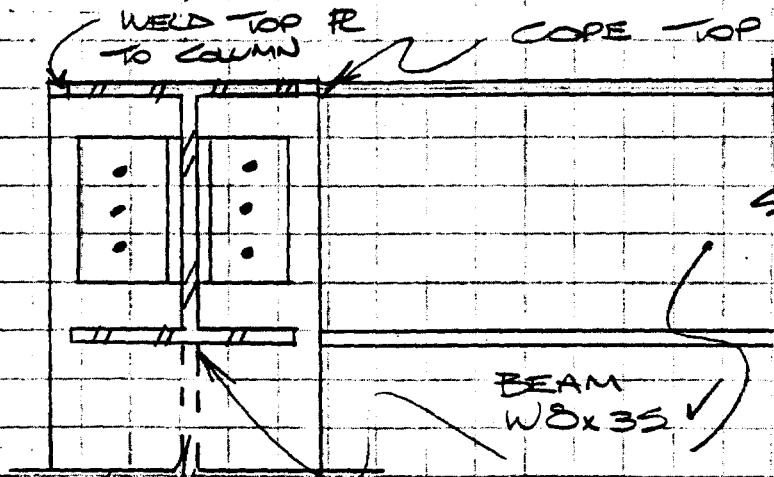
RESISTED BY 2 SETS BRACING IN BOTH
90° DIRECTIONS.

∴ LOAD ON 1 SET BRACING = 3 K. HOR.

WIND LOAD GOVERNS (12 K)

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 2372-10PROJECT NAME: SUMMITNATIONALDATE: OCT 23/92DESIGNED BY: P.D

CHECKED BY: _____

PAGE 29 OF _____**DESIGN BEAM COLUMN CONNECTIONS**

DETAIL AT CORNER
COLUMNS

i) MAXIMUM FACTORED
SHEAR FOR
CONNECTIONS

$$\begin{aligned}
 P_f &= \sqrt{14 \text{ psf} (12) + 17.5 \text{ psf} (12)} \\
 &\times \frac{52 \text{ ft}}{2} \left(\frac{21 \text{ ft}}{2} \right) \\
 &= 12.2 \text{ k}
 \end{aligned}$$

MAX. SPAN

ii) DIMENSIONS OF W8x35
 $d = 8.0''$ ✓
 $b_f = 8.0''$ ✓
 $t_w = 5/16''$ (0.310'') ✓
 $t_f = 1/2''$ ✓

TABLE III AISC PG 5-34

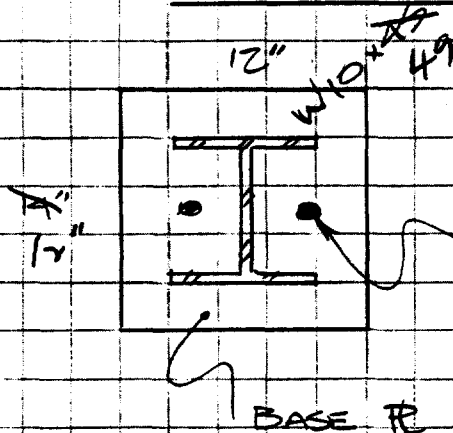
ANGLE TO WEB, USE WELD A $P = 60.5 \text{ k}$ ✓ $3/16''$ WELD ✓
 & ANGLE $5\frac{1}{2}''$ LONG ✓, $\angle 4' \times 3\frac{1}{2}' \times \frac{1}{4}''$
 REQ'D MINIMUM WEB, $\phi F_v = 20.2 \text{ ksi}$ ✓
 THICKNESS $t_w = 0.41''$ ✓

REDUCED CAPACITY

$$\frac{0.310 \text{ in}}{0.410 \text{ in}} (60.5 \text{ k}) = 45.7 \text{ k}$$

USE 2 BOLTS / ANGLE TO CONNECT TO
 COLUMN, 2- $3/4'' \phi$ USE 3- $3/4'' \phi$ BOLTS (MIN).

NOTE: WHEN BOLTING INTO W10x49 WEB
 USE CLIP ANGLES $\angle 3\frac{1}{2} \times 3\frac{1}{2} \times \frac{1}{4}'' \times 5\frac{1}{2} \text{ LG.}$ ✓

CRA**CONESTOGA-ROVERS & ASSOCIATES**PROJECT No.: 7372-10PROJECT NAME: SUMMITNATIONALDATE: OCT 5/92DESIGNED BY: P.D.CHECKED BY: km7PAGE 30. OF 1. BASE PLATE DESIGN

MAXIMUM AXIAL LOAD

$$P_p = \left[14 \text{ psf} (12) + 17.5 \text{ psf} (16) \right] \times \frac{52 \text{ ft}}{2} = 24.5 \text{ k} \quad \checkmark$$

BASE PL

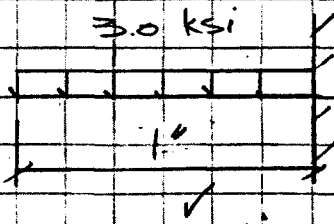
ASSUME $f_c' = 3.0 \text{ ksi}$ ✓

$$P_p = 0.85 f_c' A_1$$

$$A_1 = \frac{24.5 \text{ k}}{0.85 (3.0 \text{ ksi})}$$

$$= 9.6 \text{ in}^2$$

USE A PL 12" x 12", THE THICKNESS REQ'D FOR THE PL 12" x 12"



$$M = \frac{w l^2}{2}$$

$$M = \frac{3.0 \text{ k/in} (12 \text{ in})^2}{2} = 1.5 \text{ in.k.} \quad 0.09$$

$$f = \frac{1.5 \text{ in.k.}}{12 \text{ in} \times 12 \text{ in}} = 0.01 \text{ ksi}$$

$$S_x = \frac{b d^2}{6}$$

$$S_x = \frac{M}{\phi F_y}$$

$$d^2 = \frac{6 (1.5 \text{ in.k.})}{0.9 (36 \text{ ksi}) (12 \text{ in})}$$

$$d = 0.53 \text{ in} \quad \text{or } 9/16 \text{ PL} \quad \text{USE } 3/4 \text{ PL.}$$

USE 2 - 3/4" Ø (THREADED REBAR) 12" LONG.

2. CHECK UPLIFT ON BASE PL

MAXIMUM UPLIFT

$$P_u = \left[14 \text{ psf} (12) - 16.8 \text{ psf} (16) \right] \frac{52 \text{ ft}}{2} = -1.5 \text{ k} \quad \checkmark$$

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10PROJECT NAME: SUMMITNATIONALDATE: OCT 23/92DESIGNED BY: P.D.CHECKED BY: h.w.2PAGE 31 OF

$$P_f = 5.5 \text{ k} \quad \checkmark \quad \text{UPLIFT}$$

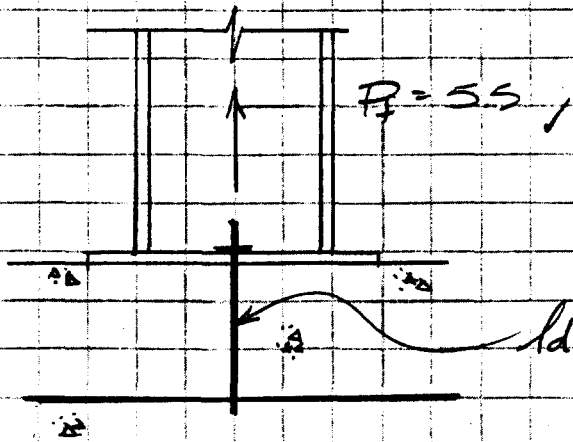
- i) CHECK DEVELOPMENT LENGTH REQ'D FOR ANCHOR BOLTS IN TENSION

$$l_d = 0.04 A_b f_y / \sqrt{f_c} \quad \text{ACI 318 - 12.2.2}$$

$$= 0.04 \frac{(0.442) 60000}{\sqrt{3000}} \quad A_b = \pi (0.75)^2 / 4$$

$$= 19.4" \quad = 0.442 \text{ in}^2$$

- ii) CHECK A BENT HOOK ACI 318 - 12.5.3.1



$$l_{hb} = 1200 d_b / \sqrt{f_c}$$

$$= 1200 (0.75 \text{ in}) / \sqrt{3000}$$

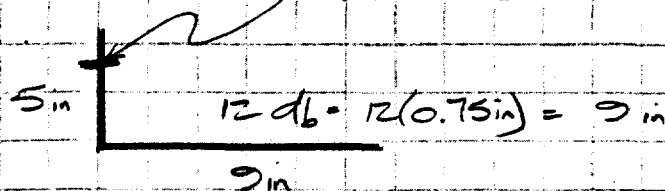
$$= 16.4 \text{ in}$$

ENSURE MINIMUM 2 in COVER AROUND HOOK, THUS CAN REDUCE BY A FACTOR OF 0.7

$$l_{hb} = 0.7 (16.4 \text{ in})$$

$$= 11.5 \text{ in}$$

ie: USE 90° BEND & 12 d_b EXTENSION THREADED



NOT NECESSARY.

USE NORMAL ANCHOR BOLT

2 - 3/4" φ x 24"

CHECK WIND SHEAR

$$P_{v3} = 0.33 \times 5.6 = 1.85$$

$$\text{shear } S = \frac{5.6}{2 \times 0.44} = 6.36$$

ANNUAL
10 x
A332
20



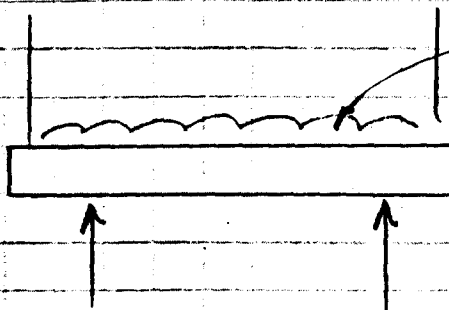
CONESTOGA-ROVERS & ASSOCIATES

PROJECT No: 2372-10
 PROJECT NAME: SUMMIT. NAT.
STRUCTURAL.
 DATE: 28. Sept. 92.

DESIGNED BY: NM7
 CHECKED BY: _____
 PAGE 34 OF _____

PILE FOUNDATIONS FOR TANKS.

① BIO ROTATOR

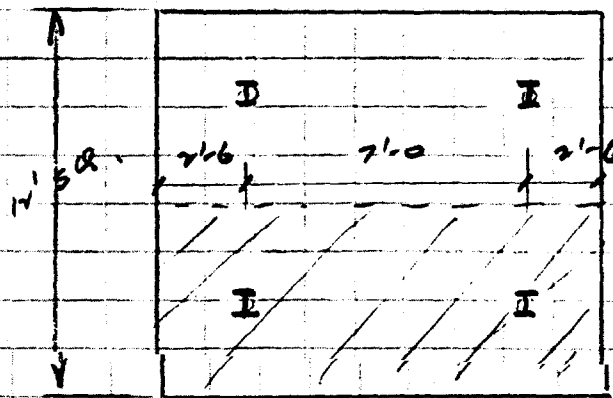


$$VDL = \frac{196400}{144} = 1.364 \text{ ksf}$$

$$\text{LOAD/PILE} = \frac{196.4 \text{ k}}{14.6} = 13.45 \text{ k}$$

$$\frac{14.6}{4} = 3.65 \text{ k}$$

USE 12 B 53.
 SEE SOILS
 REPORT.



$$\frac{1.364 \times 14.6}{1.589} = 12.5 \text{ k}$$

PILE ROTATION

$$= 1.364 \times 6 \times 6 = 49.1 \text{ k}$$

$$+ \text{GWC @ } 22.5 \text{ k/ft} = 8.1 \text{ k}$$

$$\underline{57.2 \text{ k}}$$

$$+ M_{\text{MAX}} = (57.2 \times 3.5) - \frac{1.60 \times 6 \times 6 \times 6}{2} = 200.2 - 173 = 27 \text{ k'}$$

$$- M = \frac{1.60}{2} \times 2.5 \times 2.5 \times 6 = 30.0 \text{ k'}$$

$$+ M/1' = \frac{27}{6} = 4.5 \text{ k' / 1'}$$

$$- M/1' = \frac{30.0}{6} = 5.0 \text{ k' / 1'}$$

$$A_s + v_c = \frac{4.5}{1.8 \times 14} = 0.21 \text{ in}^2 \quad \underline{5 @ 14}$$

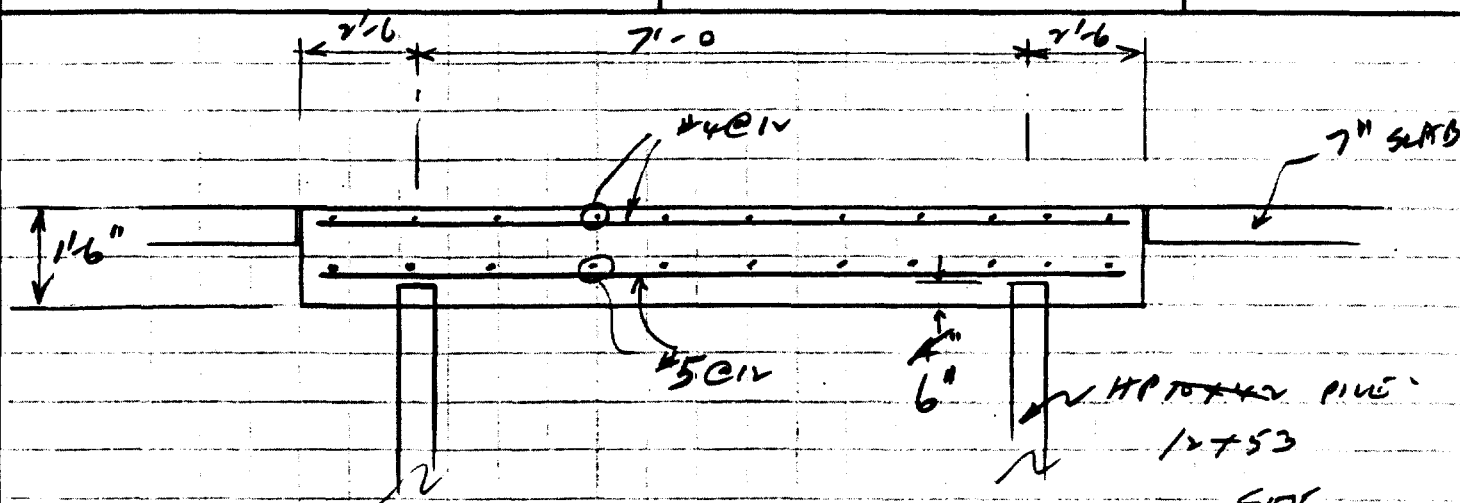
$$A_s - v_c = \frac{5.0}{1.8 \times 15} = 0.18 \text{ in}^2 \quad \underline{4 @ 14}$$

CRA

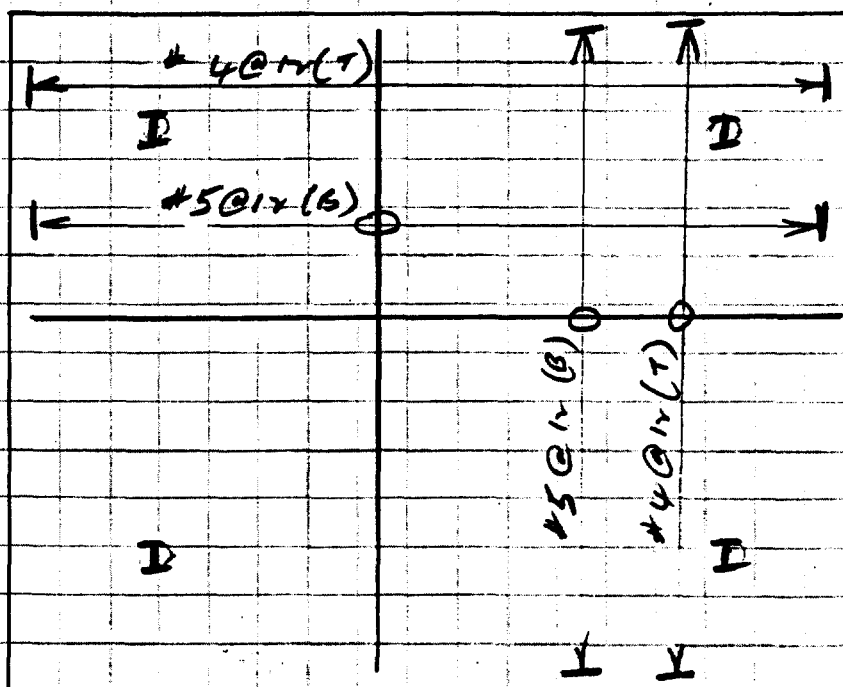
CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10
PROJECT NAME: SUMMIT NKT
STRUCTURAL
DATE: 28 Sept. 92

DESIGNED BY: WM
CHECKED BY: _____
PAGE 35 OF _____



SEE
SOILS
REPORT



CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 7372-10

PROJECT NAME: SUMMIT

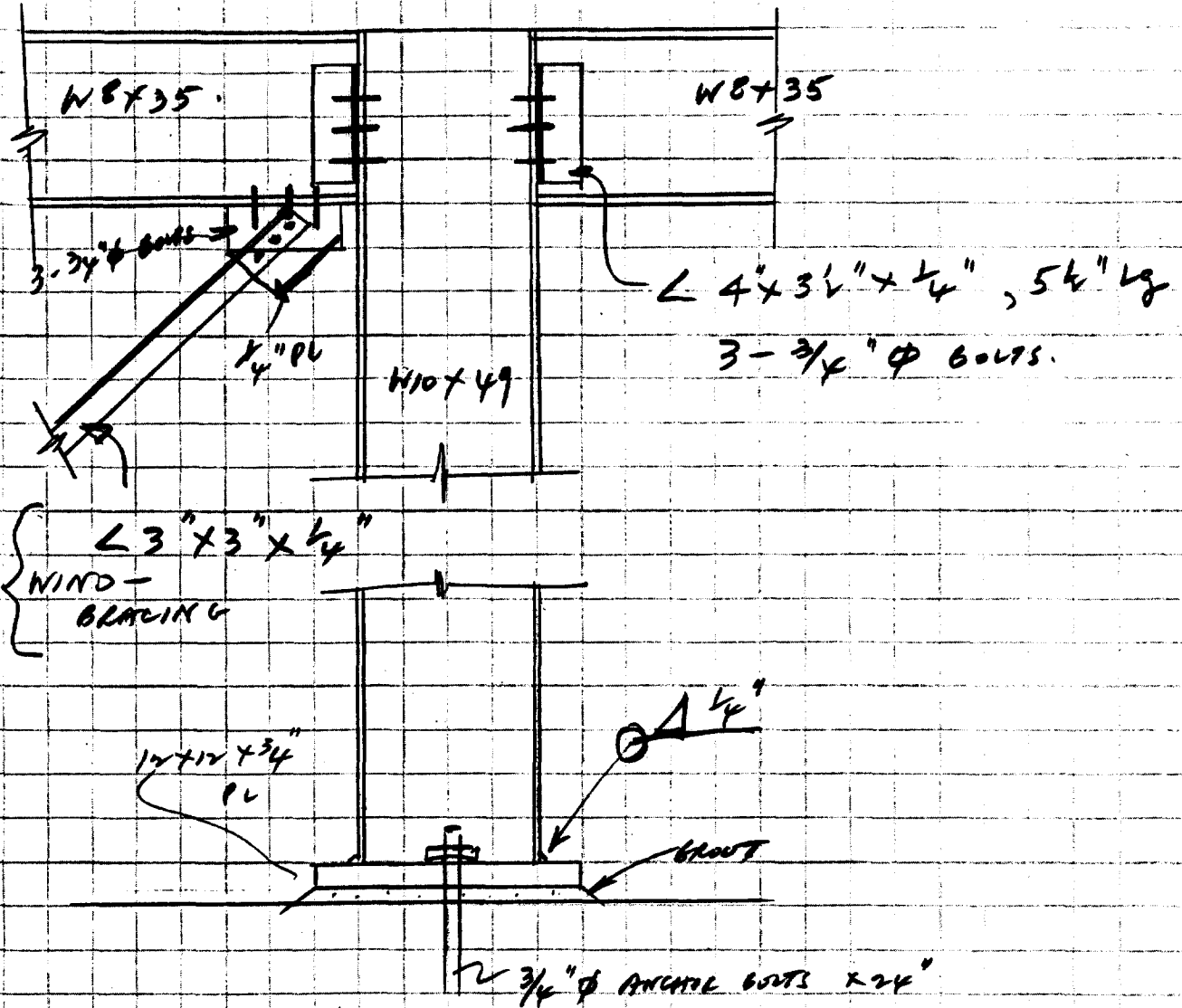
NATIONAL

DATE: OCT 23/92

DESIGNED BY: PD

CHECKED BY: MEZ

PAGE 32 OF



CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10
PROJECT NAME: SUMMIT NAT
STRUCTURAL
DATE: 24 SEPT. 92

DESIGNED BY: WM7
CHECKED BY: _____
PAGE 33 OF _____

FOUNDATIONS

FINAL

DESIGN

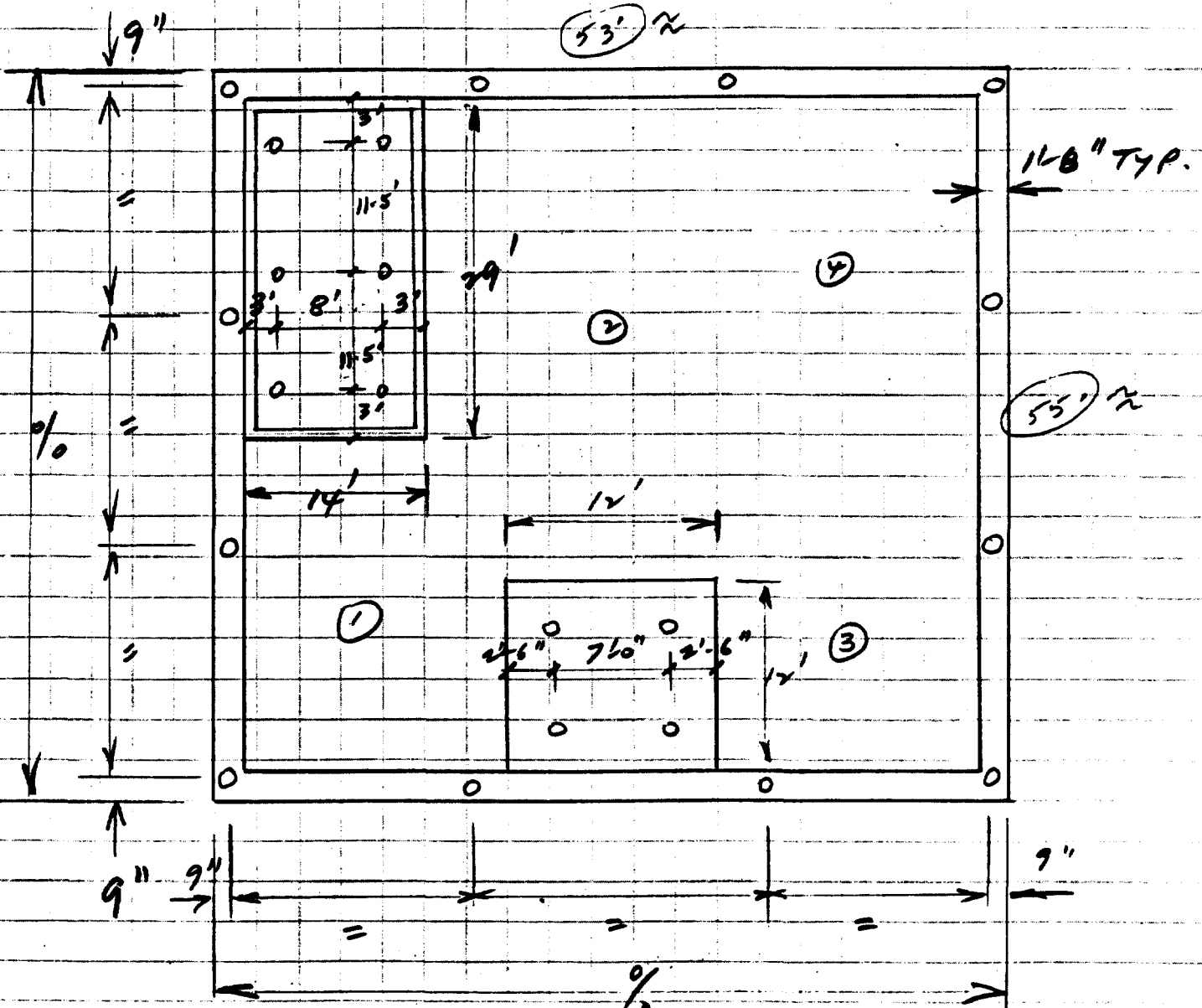
CHOSEN OPTION:

— COMBINATION

PILES UNDER HEAVY LOADS

& SLAB ON GRADE FOR REMAINDER.

(30 k. piles)



CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No: 2372-10

PROJECT NAME: SUMMIT, NAT.
STRUCTURAL

DATE: 28 Sep. 92.

DESIGNED BY: NM7

CHECKED BY:

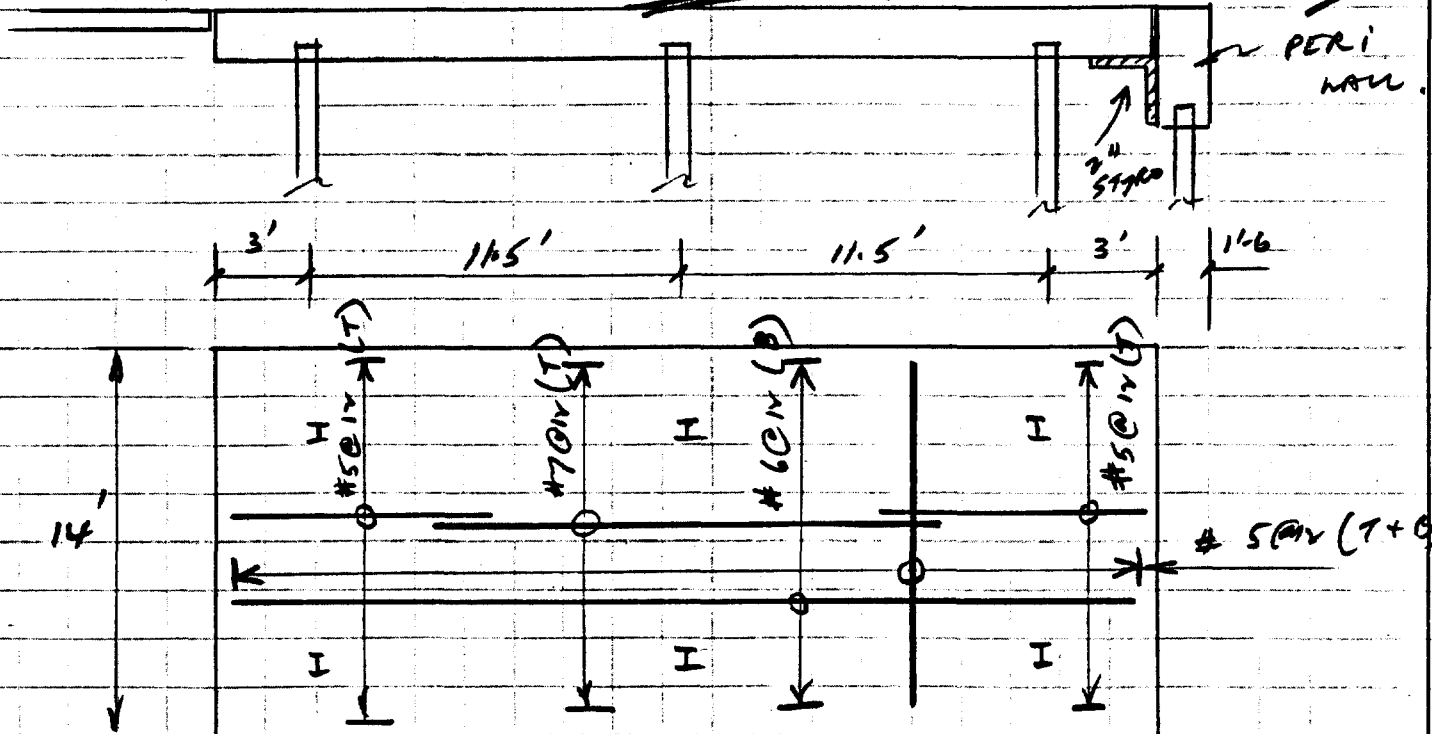
PAGE 36 OF

② CARBON TANKS

$$1.112 + 14 \times \frac{29}{8} = 564 \text{ k/ft}$$

8 Piles

$$VOL = 2(180,000) \\ 14 \times 29 \\ + CONC. @ .225 \\ = 0.887 + .225 \\ = 1.112 \text{ k/ft}$$



$$+M_{MAX} \approx 0.07 \times 1.112 \times 11.5^2 = 10.29 \text{ k-ft} \quad (\text{at HIGH})$$

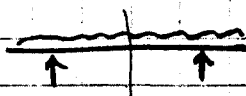
(CISC P. 5-95)

$$-M \approx 1.75 + 112 \times 11.5^2 = 18.4 \text{ k-ft} \quad (")$$

$$AS + VL = \frac{10.29}{1.8 \times 12} = 0.48 \text{ in}^2 \quad \# 6 @ 12 \text{ OK}$$

$$AS - VL = \frac{18.4}{1.8 \times 15} = 0.68 \text{ in}^2 \quad \# 7 @ 12 \text{ OK}$$

CHECK 14' SPAN.



$$R = 1.112 \times 7 \\ = 7.78 \text{ k}$$

$$M + = (7.78 \times 4) - 1.112 \times \frac{7^2}{2} = 31.1 - 27.2 \\ = 4 \text{ k-ft}$$

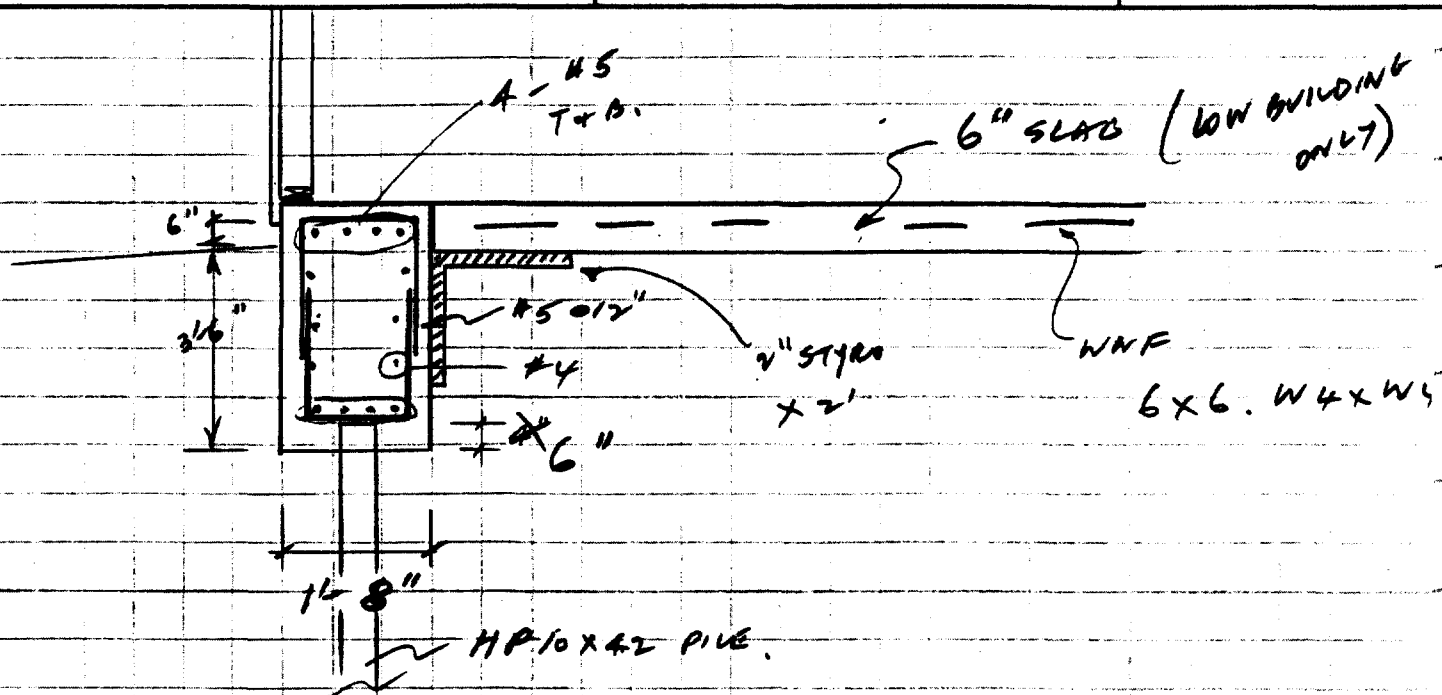
$$M - = 3 \times 1.112 \times \frac{3}{2} = 5.0 \text{ k-ft}$$

$$AS = \text{SAME AS } 0.22 \quad \# 5 @ 12$$

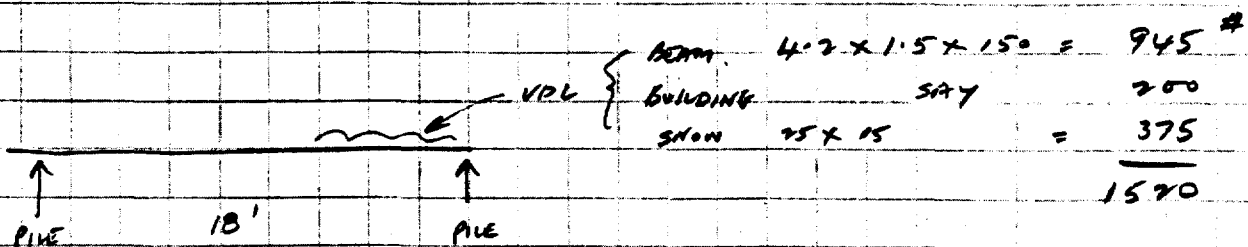
CRA**CONESTOGA-ROVERS & ASSOCIATES**

PROJECT No.: 7372-10
 PROJECT NAME: SUMMIT NAM
STRUCTURAL
 DATE: 24 SEPT. 92

DESIGNED BY: NM7
 CHECKED BY: _____
 PAGE 37 OF _____



LOW ROOF BUILDING - PERIMETER WALL



$$M \approx \frac{W L^2}{10} = \frac{1.52 \times 18^2}{10} = 49.3 \text{ k-ft}$$

$$A_s = \frac{49}{1.8 \times 42} = 0.65 \text{ in}^2 \quad \boxed{4 - \#5} = 1.24 \text{ in}^2$$

whichever is greater, the design *wind loads* shall not be less than those of Exposure A in accordance with ASCE 7 listed in Appendix A.

1112.3.5 Slender buildings and structures: Buildings and other structures having a *height* exceeding five times the least horizontal dimension or having a fundamental natural frequency less than 1 cycle per second shall be designed for *wind loads* which include a gust response factor that has been determined by a rational analysis that incorporates the dynamic properties of the main windforce-resisting system.

1112.3.6 Internal pressure: The main windforce-resisting system for buildings shall be designed for internal pressure in accordance with ASCE 7 listed in Appendix A.

1112.3.7 Roof overhangs: Roof overhangs shall be designed for pressures acting on the top surface as set forth in Table 1112.2a(3) in combination with positive pressures on the bottom surface corresponding to $C_p = 0.8$.

SECTION 1113.0 EARTHQUAKE LOADS

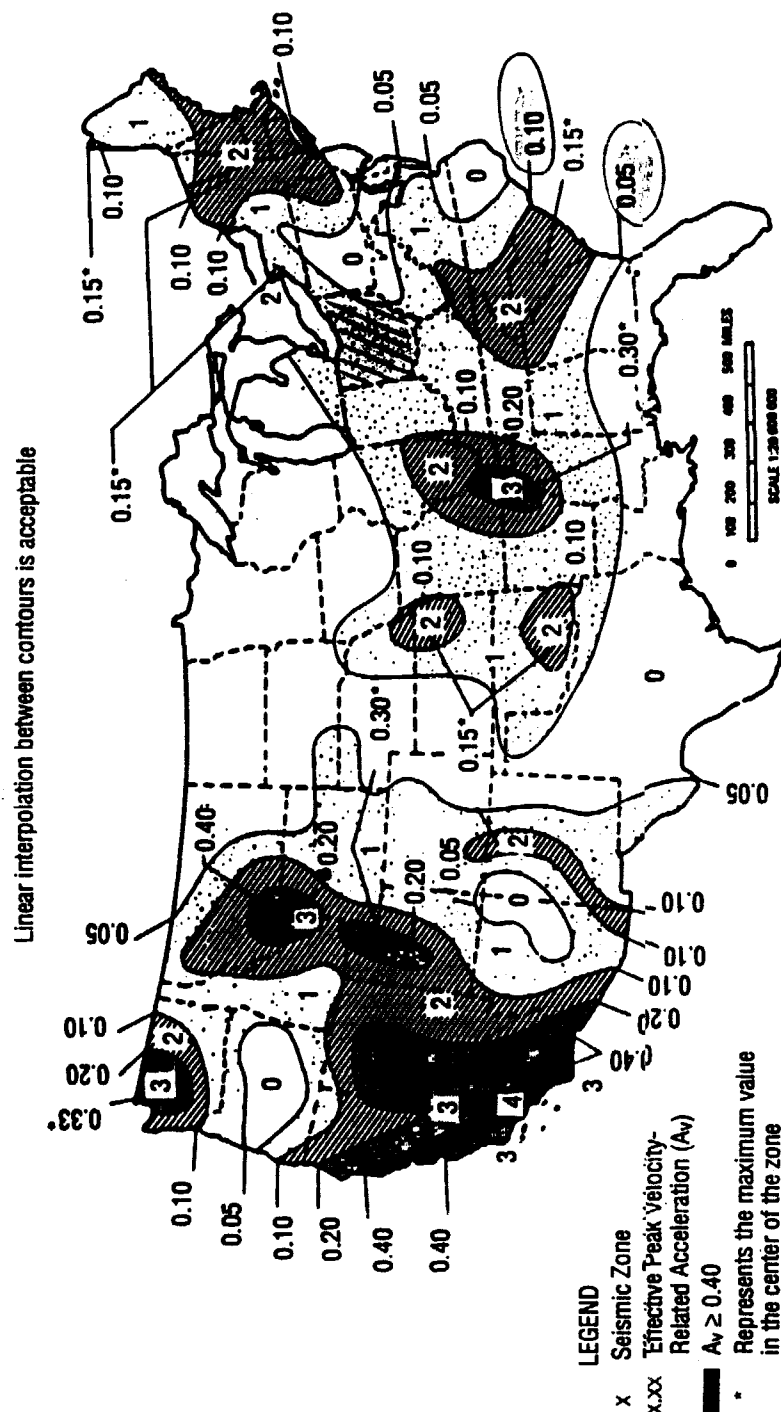
1113.1 General: Every building and structure, and portion thereof, shall be designed and constructed to resist the earthquake effects determined in accordance with this section. Seismic zones shall be determined by location in Figure 1113.1. Where *wind load* requirements of Section 1112.0 would produce higher stresses, such stresses shall be used in lieu of the stresses resulting from earthquake forces.

Exceptions

1. Buildings or structures in Use Group R-3 located in Seismic Zone 0, 1 or 2 are exempt from the requirements of this section.
2. All buildings or structures in Seismic Zone 0 and all buildings or structures in Seismic Zone 1 that have an importance factor (I) in Table 1113.1 of less than 1.5, shall only be required to comply with Sections 1113.11.1 and 1113.11.2.
3. Buildings and structures that represent a low hazard to human life in the event of failure, such as agricultural buildings, certain temporary facilities and Use Group U storage facilities, are exempt from the requirements of this section.

Except for unreinforced masonry, the determination of forces in this section depends on the ability of a structure to remain stable when members are strained into the inelastic range during a major earthquake. Structural concepts other than those set forth in this section shall be permitted when evidence is submitted showing that equivalent ductility and energy dissipation are provided. While the requirements in this section refer primarily to an equivalent static-force method, other procedures used to establish the seismic forces and the distribution of such forces shall be permitted if the corresponding internal forces and deformations in the members are determined using a model consistent with the procedure adopted. Principles governing the use of dynamic analysis are given in Section 1113.8.

FIGURE 1113.1
MAP OF SEISMIC ZONES AND EFFECTIVE PEAK VELOCITY-RELATED ACCELERATION (A_v)
CONTIGUOUS 48 STATES



CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372 - 10PROJECT NAME: SUMMITNATIONALDATE: Oct. 22/92DESIGNED BY: L.A.CHECKED BY: mm?PAGE 38 OF ① CHECK **EARTHQUAKE** LOAD ON CARBON CONTACTORS

FOCUS USE 0.075 OF VERTICAL LOAD P.

ZONE 1.
IMPORTANCE FACTOR 1.0
COMPLY WITH
1113.11.1 + 1113.11.2
N/A. 5%

$$\begin{array}{rclcl}
 \text{DUE CARBON CONTACTORS} & = & 2 \times 180 & = & 360 \text{ K} \quad \checkmark \\
 \text{DL CONC. } 1.5 \times 14 \times 29 \times 0.15 & = & 91.4 \times 1 & = & 91 \text{ K} \quad \checkmark \\
 40\% \text{ WT PILES } = 6 \times 17 \times 0.04 / 2 & = & 2 & = & 2 \text{ K} \\
 & & & & \underline{453 \text{ K}}
 \end{array}$$

USING LATERAL LOAD IN ANY DIRECTION = 0.075×453 No $= 34 \text{ K}$ PILE CAPACITY = $\frac{60}{30} \text{ K} / \text{PILE}$ i.e. $\frac{30}{26} \text{ PILES}$. BATTER 1:10.LATERAL LOAD / PILE 1:10 BATTER = $\frac{6.0}{4.0} \text{ K}$ MAXIMUM.No of ~~PILE~~ PILES REQUIRED $\frac{\text{VERT.}}{1} = 453 / \frac{60}{30} = 7.55 + 0.1 = 8$ SAY 8 ✓No of BATTERED PILES REQ'D = $34 / \frac{6.0}{4.0} = 5.7$ SAY 6 ✗USING 0.5% NO. BATTERED = $23 / 6 = 3.8$ SAY 4 ✓
5% ✓

② CHECK EQ ON PROTRACTOR.

$$\begin{array}{rclcl}
 \text{DL + U of PROTRACTOR} & = & 197 \text{ K} & + & \text{OT.} \\
 \text{DL CONC } 1.5 \times 12 \times 13.5 \times 15 & = & 37 & & \\
 & & \underline{234 \text{ K}} & & \checkmark
 \end{array}$$

No PILES REQ'D VERTICALLY = $234 / 60 = 3.9 = 4$ ✓No " " BATTERED = $234 \times 0.5 / 6 = 1.95 = 2$ ✓BATTER 1/10 AT 45°. i.e. 707 USING 75% SAY OR ✓

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2972

PROJECT NAME: SUMMIT

NATIONAL

DATE: OCT. 22/92

DESIGNED BY: RLA

CHECKED BY: MM7

PAGE 39 OF

③ EARTHQUAKE LOAD ON BUILDING. (MAIN BUILDING)

BUILDING IS APPROX. 55' x 68' x 33' (MAIN BUILDING)
PERIMETER 246'

DL + SNOW ON ROOF SAM

DL	5.0	BUILT UP ROOF
	0.5	INSULATION
	1.5	STEEL DECK
	5.0	STEEL
	5.0	MECH
	17.0	psf

DL WALLS SAM

DL = 7.0 psf.

TOTAL DL WALLS	= .0070 x 33 x 246	= 56.8 kips	} 120.4
TOTAL DEAD ROOF	= .017 x 55 x 68	= 63.6	
SNOW + LL	= .030 x 55 x 68	= 112.1	

ADD DL FOOTING	= .788 ^{4/ft} x 246	= 194 k	✓
+ DL FLOOR (6")	= 55 x 68 x .075	= 280 k	✓

TOTAL VERTICAL PILES REQ'D	= 597 / 60	= 10.0	✓
----------------------------	------------	--------	---

TOTAL BATTERED	= .05 x 597 / 6	= 4.98	= 156 SAM	✓
----------------	-----------------	--------	-----------	---

12 VERTICAL PILES PROVIDED → OK ✓

BATTERED PILES. 2 IN EACH DIRECTION. MAIN BUDG.

BATTER CORNER PILES - @ 45° SAM. THEN 1/2 OR

* FOR LL + DL ON FLOOR REQUIRES ADDED PILES. BATTERED

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2392

PROJECT NAME: Summit

NATIONAL

DATE: Oct. 22/92

DESIGNED BY: RLA

CHECKED BY: Wm J

PAGE 40 OF

④ RECHECK EARTHQUAKE LOAD ON MAIN BUILDING

BUILDING IS APPROX. $.455' \times 68' \times 33'$ HIGH (MAIN BLDG) ✓
 PERIMETER 246'

DL ROOF 17.0 psf TOTAL ✓

DL WALLS 7.0 psf TOTAL. ✓

TOTAL DL WALLS = $.007 \times 33 \times 246$ = 57 KTOTAL DL ROOF = $.017 \times 455 \times 68$ = 64 KDL OF FOOTING = 1.0×246 = 246 KDL FLOOR @ (6') = $.15' \times .5' \times 51 \times 64$ = 245 K

DL OF EQUIP (NATIONAL) = SURGE TANKS (2) = 27 K ✓ 612 ✓

= SAND FILTER = 16 K ✓

= SLUDGE & DEWATER = 40 K ✓

= CHEMICALS. = 62 K ✓

= ADSORBERS = 16 K ✓

= EQUALIZATION. = 35 K ✓

= SETTLING TANK = 11 K ✓

= SURGE TANK. = 18 K ✓

= MISC = 5 K ✓

842 K

TOTAL. ✓

+50% on floor = $.050 \times 51 \times 64$ ✓

= 163

1005 K ✓

USING $.05 \times 1005$ = $.05 \times 1005$ = 50 K LATERAL LOAD.No of batterpiles $1:10 = 50/6 = 8.33$ SAY 8. ✓

No of piles total required.

$$= \frac{612}{10.2} = 60$$

SAY 12 ✓

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10

PROJECT NAME: SUMMIT
NATIONAL - STRUCT.

DATE: 26 OCT. 97

DESIGNED BY: WM7

CHECKED BY: _____

PAGE 41 OF _____

CHECK PILE EMBED. IN CONC.

MAX. HOR. LOAD / PILE =

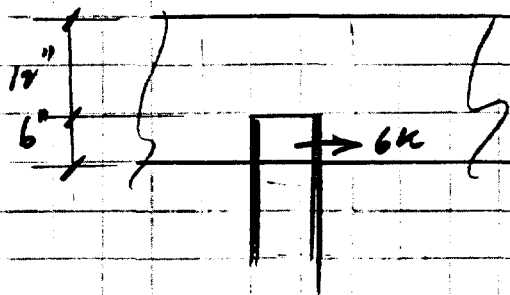
CARBON ABSORBEN P. 38.

$$\frac{453 \times 5\%}{4 \text{ piles}} = 5.66 \text{ K}$$

BI. RETENTION

$$\frac{724 \times 5\%}{2} = 5.85 \text{ K}$$

USE 6 K. HOR.



$$\text{BEARING AREA} = 6 \times 12 = 72 \text{ in}^2$$

$$\text{STRESS} = \frac{6,000}{72} = 83 \text{ psi}$$

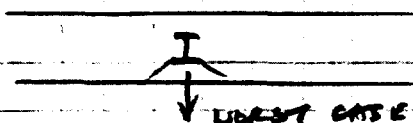
NOMINALCHECK BUILDING PILES. SIDE COLS B3, B4, H3, H4.

$$V = 52 \times 36 \times (14 + 7) = 39 \text{ K} + \text{GRADE BERM}$$

$$= 39 + \sqrt{36 \times 1.67 \times 4.5 \times 1.15} = 81 + 39 = 120 \text{ K}$$

$$H = 0.05 \times 120 = 6 \text{ K}$$

$$2 \text{ piles BR. SIDE} = 3 \text{ K / pile}$$



$$\text{STRESS} = \frac{3,000}{12 \times 6} = 42 \text{ psi}$$

NOMINAL

✓

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.:

2372-10

PROJECT NAME:

SUMMIT. NAT.
STRUCTURAL

DATE:

OCT. 26/92.

DESIGNED BY:

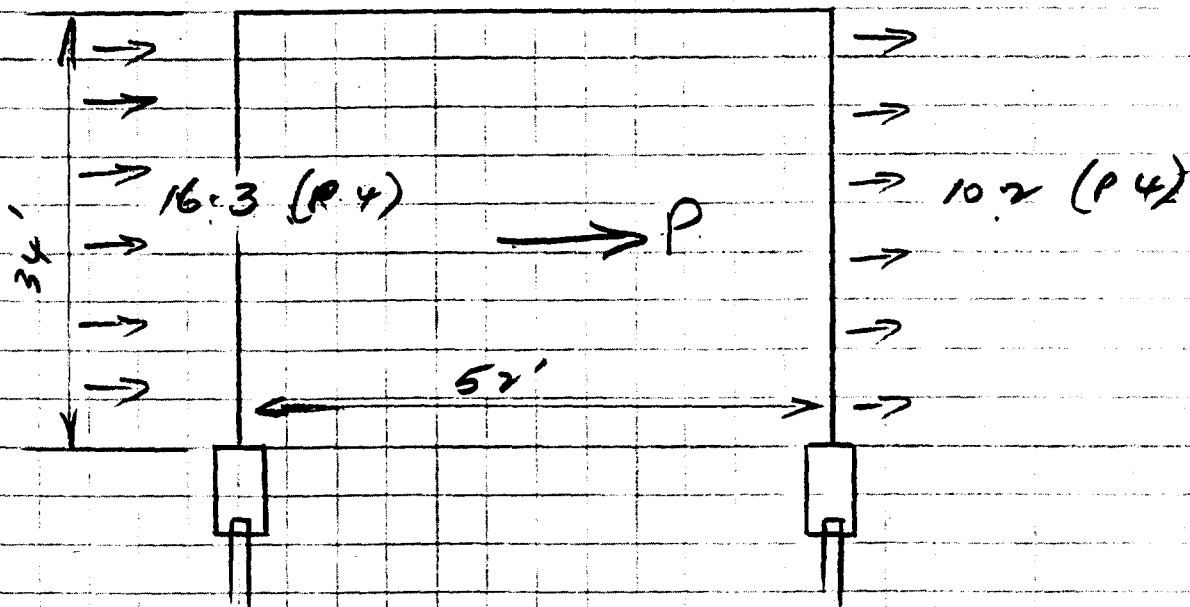
MM7

CHECKED BY:

PAGE

42

OF

CHECK PILE UPLIFT.

$$\text{TOTAL WIND LOAD} = (16.3 + 10.2) [34 \times 52]$$

$$P = 50.46 \text{ K}$$

$$M @ \text{Base} = 50.46 \times 17'$$

$$= 858 \text{ K}'$$

Reaction by pile couple $R \times 52$

$$\therefore R = 16.5 \text{ K TOTAL}$$

$$\text{Vertical building load} = \frac{120.4 \text{ P39}}{2} = 60.2 \text{ K EACH SIDE}$$

\therefore DL governs, no pile uplift.

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10

PROJECT NAME: SUMMIT NAT.
STRUCTURAL.

DATE: 27 Oct 92.

DESIGNED BY: WMT

CHECKED BY:

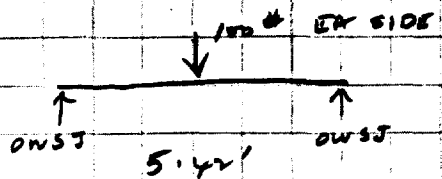
PAGE 43 OF

ROOF EQUIPMENT SUPPORTS.

MAIN ROOF

FAN VENTS.

NOMINAL 200 #



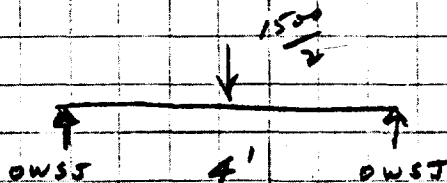
$$M = \frac{100 \times 5.42}{4} \text{ K}' = 0.14 \text{ K}'$$

USE 6 [13. $M_R = 10.6$ $L_u = 5.6'$

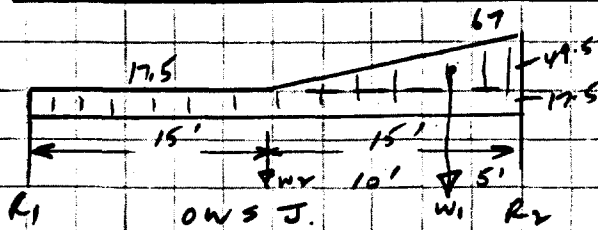
LOW ROOF

AC. UNIT.

1500 #



$$M = \frac{.75 \times 4}{4} = 0.75 \text{ K}'$$

USE 6 [13. $M_R = 12.6$ $L_u = 5.6'$ CHECK SW 35 LOW BLDG FOR ADDN. SNOW LOAD

$$M_L = 17.5 \times 30 \times 6' \text{ (sprung)}$$

$$= 3.15 \text{ K}$$

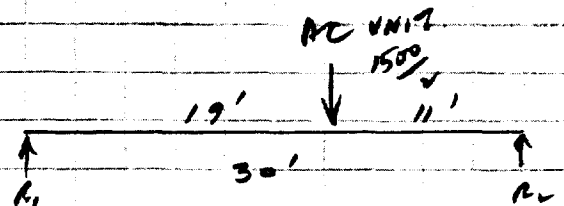
$$M_T = \frac{15}{4} \times 49.5 \times 6'$$

$$= 2.23 \text{ K}$$

$$M_{R1} : (15 \times 3.15) + (25 \times 2.23) = 30 R_2$$

$$R_2 = \frac{47.25 + 55.75}{30} = 3.43 \text{ K}$$

$$R_1 = 1.95 \text{ K}$$



$$M_{R1} : 30 R_2 = 19 \times .75$$

$$R_2 = 0.48 \text{ K}$$

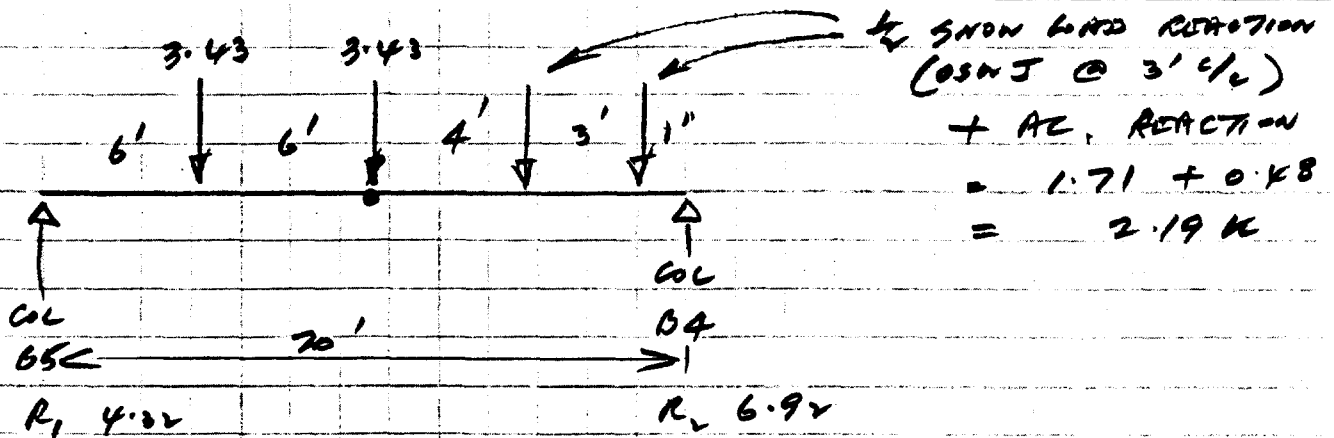
$$R_1 = 0.27 \text{ K}$$

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10
 PROJECT NAME: SUMMIT NAT. STRUCTURAL
 DATE: 007 27/92

DESIGNED BY: WM7
 CHECKED BY: _____
 PAGE 44 OF _____



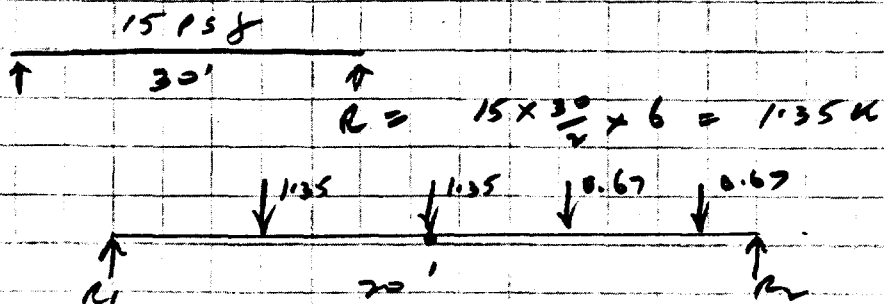
$$\begin{array}{rcl}
 M_{R_1}: & 20 R_2 = & 3.43 \times 6 = 20.58 \\
 & & 3.43 \times 12 = 41.16 \\
 & & 2.19 \times 16 = 35.04 \\
 & & 2.19 \times 19 = 41.61 \\
 & & \hline
 & & 11.24 \text{ k} \quad 138.39
 \end{array}$$

$$R_2 = \frac{138.39}{20} = 6.92 \text{ k}$$

$$R_1 = 11.24 - 6.92 = 4.32 \text{ k}$$

$$M_o = (4.32 \times 12) - (3.43 \times 6) = 51.84 - 20.58 = 31.26 \text{ k'}$$

ADD FOL ROOF DL 15 PSF



$$\begin{array}{rcl}
 M_{R_1}: & 20 R_2 = & 1.35 \times 6 = 8.1 \\
 & & 1.35 \times 12 = 16.2 \\
 & & 0.67 \times 16 = 10.72 \\
 & & 0.67 \times 19 = 12.73 \\
 & & \hline
 & & 47.75 \text{ k}
 \end{array}$$

$$\begin{aligned}
 M_o &= (1.65 \times 12) - (1.35 \times 6) \\
 &= 19.8 - 8.1 \\
 &= 11.7 \text{ k'}
 \end{aligned}$$

$$R_2 = \frac{47.75}{20} = 2.39 \text{ k}, \quad R_1 = 1.65 \text{ k}$$

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 7372-10
 PROJECT NAME: SUMMIT NAT.
STRUCTURAL
 DATE: 067 27/92

DESIGNED BY: NM7
 CHECKED BY: _____
 PAGE 45 OF _____

$$\text{Total } M = \underset{\text{MMX}}{31.26} + 11.70 = 42.96 \text{ K}'$$

8 W 35

$$M_R = 62.2 \text{ K}'$$

$$L_v = 20.3$$

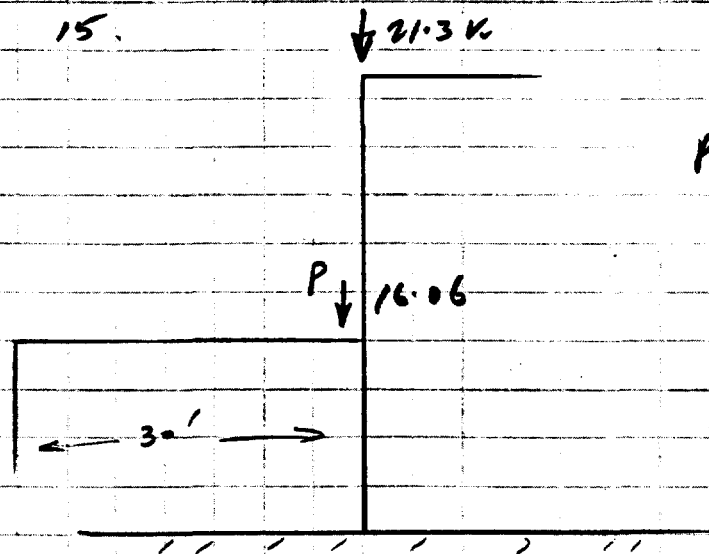
✓

OK

✓

CHECK COL. FOR ADDN. LOAD FROM LOW ROOF

SEE P 15.



$$P = \text{COL BY REACTIONS}$$

$$= \begin{array}{r} 6.92 \\ 2.39 \\ 6.75 \end{array} \left. \vphantom{\begin{array}{r} 6.92 \\ 2.39 \\ 6.75 \end{array}} \right\} 11.44$$

6.75 — below

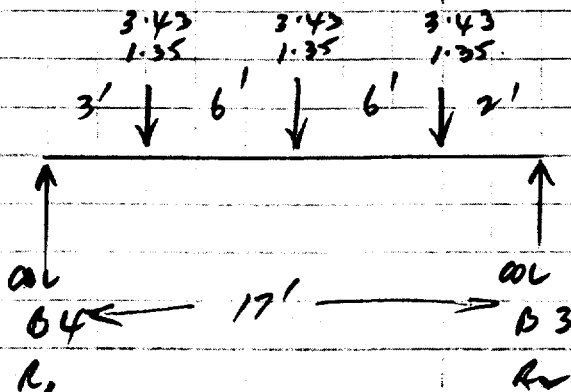
$$\underline{16.06 \text{ K}}$$

Total P

$$= 21.3 + 16.1$$

$$= \underline{37.4 \text{ K}}$$

<< allowable 83 K @ 34'
 (SEE P. 23) ✓



$$\begin{array}{rcl} \text{MR1: } 17 R_2 & = & 4.78 \times 3 = 14.34 \\ & & 4.78 \times 9 = 43.02 \\ & & 4.78 \times 15 = 71.70 \\ & & \underline{129.06} \end{array}$$

$$R_2 = \frac{129.06}{17} = 7.59 \text{ K}$$

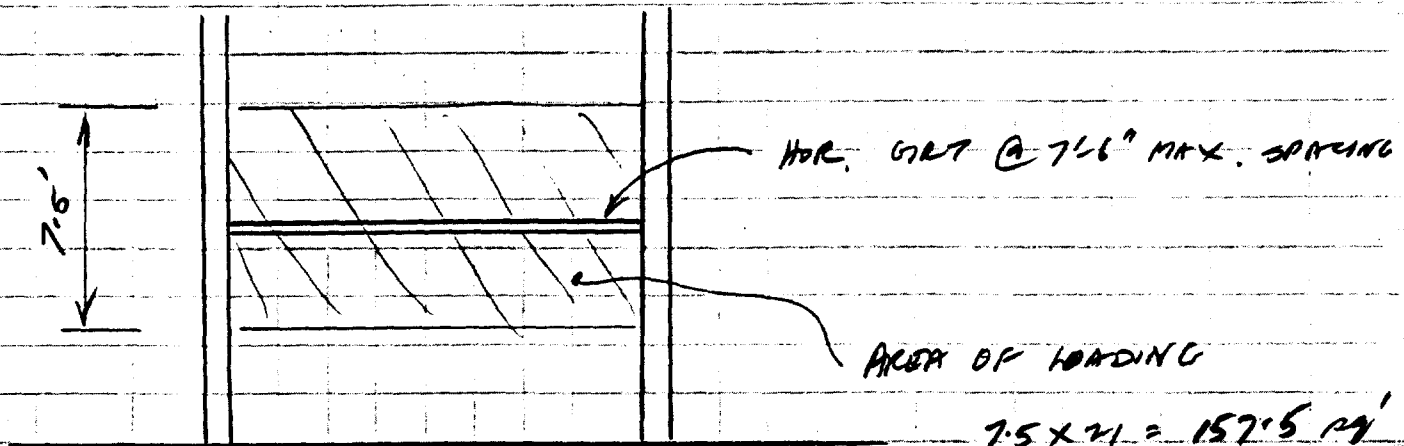
$$R_1 = 6.75 \text{ K}$$

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10
 PROJECT NAME: SUMMIT NAT
STRUCTURAL
 DATE: OW 26/92

DESIGNED BY: HAM 2
 CHECKED BY: _____
 PAGE 46 OF _____

GIRT DESIGN

MAX.
 21'

$$\text{LOAD/FT} = 7.5 \times 16.3 \text{ (PY)} \\ = 122 \text{ P/FT}$$

$$M = \frac{WL^2}{8} = \frac{122 \times 21^2}{8} = 6.73 \text{ K-FT}$$

6 I 17.5

$$M_R = 17.4 \quad L_U = 8.9'$$

$$L_{UN} = \frac{17.4}{6.73} \times 8.9 = 23' \quad \text{OK.}$$

8 [11.5

$$M_R = 14.8 \quad L_U = 5.0'$$

$$L_{UN} = \frac{14.8}{6.73} \times 5 = 11' \quad \text{N.G.}$$

9 [20

$$M_R = 24.7 \quad L_U = 5.5' \quad \text{At } L_U: \frac{24.7}{6.73} \times 5.5 = 20.2'$$

Leave for steel fabricator to design
 Will probably use Z girt.

CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10

PROJECT NAME: SUMMIT NAT.

STRUCTURAL

DATE: OCT 27/92

DESIGNED BY: HMM

CHECKED BY:

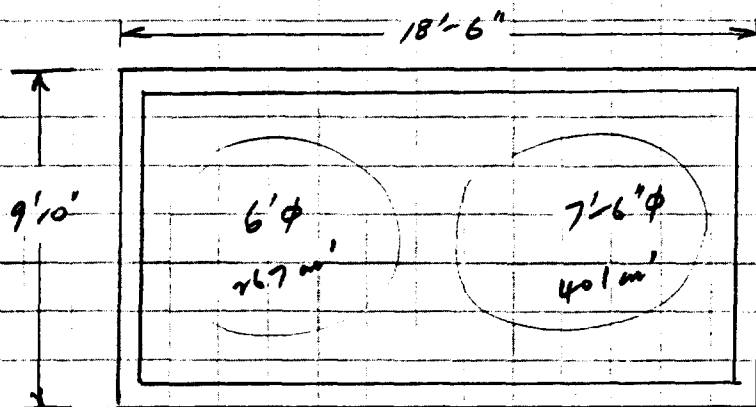
PAGE 47 OF

CHEM TANK CONTAINMENT.

NaOH 3,000 gal

ACID 2,000 gal

CONTAINMENT TO EQUAL 3,300 gals. (110%)



INTERIOR AREA =

$$(17.5 \times 8.0) - \frac{\pi \times 6^2}{4} - \frac{\pi \times 7.5^2}{4}$$

$$= 140 - 283 \text{ (or } -44.2)$$

$$= 111.7 \text{ sq' NET.}$$

(LARGE TANK CAPTURED)

$$\text{Vol REQD.} = 3,300 \text{ gals}$$

$$= \frac{3,300}{7.48} \text{ cu' } = 442 \text{ cu'}$$

$$\therefore h_{\text{reqd}} = \frac{442}{111.7} = 3.95' \quad \text{OK}$$

TRY. 6' φ NaOH + 5' φ ACID.

$$V = \frac{\pi \times 6^2}{4} \times L = 401$$

$$\therefore L = \frac{4 \times 401}{\pi \times 36} = 14.2'$$

$$V = \frac{\pi \times 5^2}{4} \times L = 267$$

$$\therefore L = \frac{4 \times 267}{\pi \times 25} = 13.6'$$

$$\begin{aligned} \text{NET AREA} &= 140 - 28.3 - \frac{\pi \times 6^2}{4} = 140 - (28.3) - 19.6 \\ &= 140 - 19.6 = 120.4 \end{aligned}$$

$$h_{\text{reqd}} = \frac{442}{120.4} = 3.67' \quad \text{OK.}$$

CRA
CONESTOGA-ROVERS & ASSOCIATES

PROJECT No: 2372-10
PROJECT NAME: SUMMIT. NAT. STRUCTURAL
DATE: OCT 27/92

DESIGNED BY: WM7
CHECKED BY: _____
PAGE 48 OF _____

CHECK FOR SMALL TANK RUPTURE

$$\text{NET AREA LEFT} = 140 - 28.3 = 111.7 \text{ sq'}$$

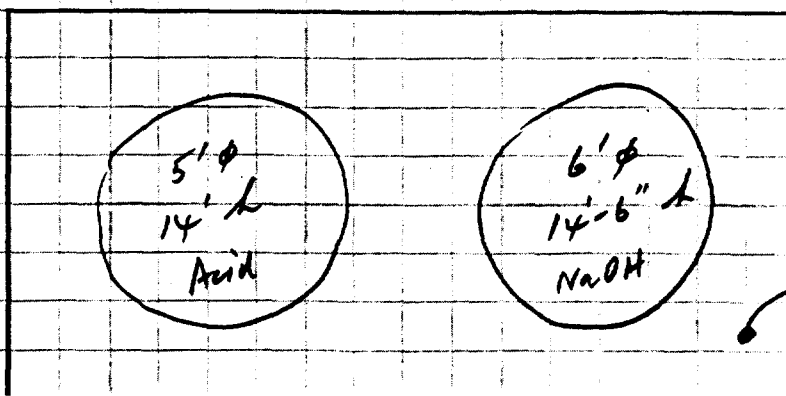
$$\text{Vol Rqd} = \frac{2200}{7.48} \times 11\% = 294 \text{ cu'}$$

$$\therefore h \text{ rqd} = \frac{294}{111.7} = 2.63' \text{ OK}$$

for $h = 4'$, floor area rqd =

$$\frac{442}{A - 19.6} = 4'$$

$$\therefore A - 19.6 = \frac{442}{4} \quad A = 110 + 20 = 130 \text{ sq'}$$



130 sq' INSIDE

WALL STEEL

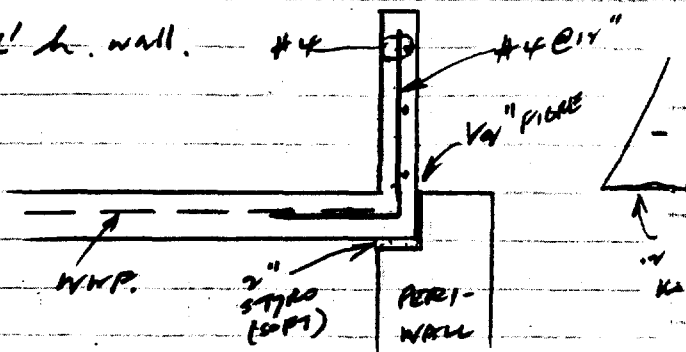
$$P = 65 \times 4 = 0.26 \text{ KSF}$$

$$P = 0.26 \times \frac{4}{3} = 0.52 \text{ K}$$

$$M = 0.52 \times \frac{4}{3} = 0.693 \text{ K'}$$

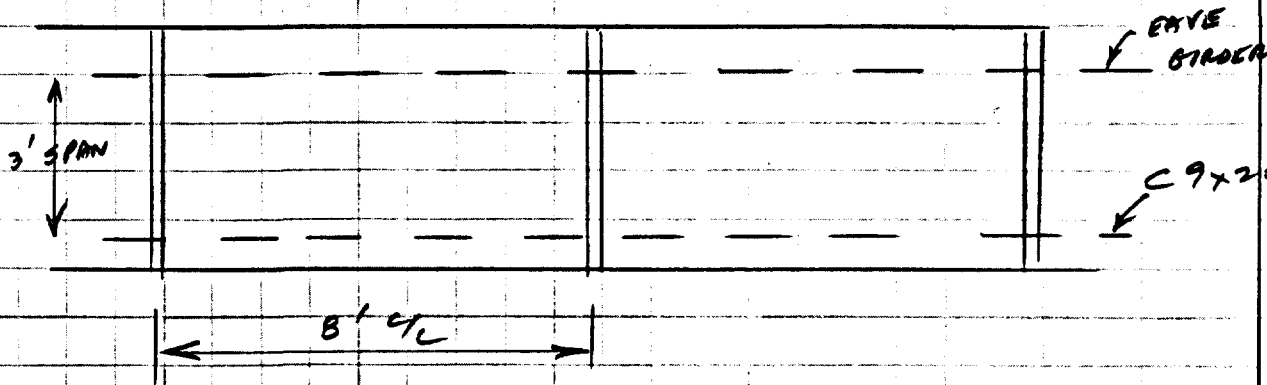
$$A_s = \frac{0.693}{1.6 \times 3.5} = 0.12 \text{ in}^2$$

$$\#4 @ 12 = 0.20 \checkmark$$



CRA

CONESTOGA-ROVERS & ASSOCIATES

PROJECT No.: 2372-10
PROJECT NAME: SUMMIT NAT
STRUCTURAL
DATE: OCT 27/92DESIGNED BY: MMJ
CHECKED BY: _____
PAGE 49 OF _____VERTICAL SUPPORTS FOR TOP 4' HORIZ SIDING

$$\text{WIND PRESSURE} = 16.3 \text{ psf (P.4)} \times 8' = 130 \text{ p/}'$$

$$M = \frac{W L^2}{8} = \frac{.13 \times 3^2}{8} = 0.15 \text{ k}'$$

TRY HIRON SECTION 3" x 2" x 4"

$$S_{YY} = 1.15 \text{ in}^3$$

$$f = \frac{150 \times 12}{1.15} = 1,565 \text{ psi} \quad \checkmark \text{ OK.}$$

APPENDIX E

PERMIT APPLICATION FORMS

APPENDIX E

TABLE OF CONTENTS

SECTION	CONTENTS
1	PERMIT TO INSTALL (PTI) APPLICATION FORM OHIO ENVIRONMENTAL PROTECTION AGENCY
2	AIR DISCHARGE PERMIT TO INSTALL APPLICATION FORM AKRON REGIONAL AIR QUALITY DIVISION
3	BUILDING AND ELECTRICAL PERMIT APPLICATION FORM COUNTY OF PORTAGE DIVISION OF BUILDING INSPECTION
4	HEATING, VENTILATING AND AIR CONDITIONING (HVAC) PERMIT APPLICATION FORM, COUNTY OF PORTAGE DIVISION OF BUILDING INSPECTION
5	PLUMBING PERMIT APPLICATION FORM PORTAGE COUNTY HEALTH DEPARTMENT
6	SEPTIC SYSTEM SITE INSPECTION REQUEST FORM OHIO ENVIRONMENTAL PROTECTION AGENCY
7	ZONING CERTIFICATE APPLICATION FORM DEERFIELD TOWNSHIP
8	POTABLE WATER SUPPLY WELL INSTALLATION PERMIT APPLICATION FORM PORTAGE COUNTY HEALTH DEPARTMENT
9	STORMWATER CONTROL PERMIT

SECTION 1

APPLICATION FORM

PERMIT TO INSTALL

OHIO ENVIRONMENTAL PROTECTION AGENCY



State of Ohio Environmental Protection Agency

Northeast District Office

2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171
AX (216) 487-0769

'Rec'd CRA

AUG 31 1992

George V. Voinovich
Governor

Donald R. Schregardus
Director

August 24, 1992

RE: Summit National
Portage County
267-0779

Mr. Gordon Reusing
Conestoga-Rovers and Assoc., Ltd.
651 Colby Drive
Waterloo, Ontario
Canada N2V 1C2

Dear Mr. Reusing:

Enclosed is a PTI application for the full scale ground water treatment plant. The PTI is not a requirement but it is a good way to demonstrate that the plant meets the substantive requirements of NPDES. The fees are waived along with other administrative requirements.

Please feel free to call me if you have any further questions.

Sincerely,

Regan S. Williams
Environmental Scientist
Division of Emergency and Remedial Response

RSW:lt

enclosure

cc: Dan Markowitz, DERR/NEDO

Ohio EPA Division of Water Pollution Control
PERMIT TO INSTALL OR PLAN APPROVAL APPLICATION
GENERAL INSTRUCTIONS

A Permit to Install is required for new or modified sources of pollution under the provisions of OAC Rule 3745-31. An application cannot be considered complete unless all applicable questions are answered and the required information has been submitted. This application must be signed in accordance with OAC Rule 3745-31-04 or it cannot be accepted. In accordance with OAC 3745-31-02, an application for a permit to install a disposal systems [as defined in ORC 6111.01(G)] shall include plans for the disposal system, and issuance of a PTI shall constitute approval of plans per ORC 6111.44 and 6111.45.

Revised Code 3745.11(G) requires an application fee of \$15.00. Revised Code 3745.11(C) requires a plan review fee of \$100.00 plus 0.2% of the estimated construction cost of the project must be submitted in the form of a check made payable to the "Treasurer of the State of Ohio". The total maximum fee is \$5015.00. The application and plan review fees are non-refundable and due at the time of application. Applicants for permits involving disposal systems will be required to pay a permit to install fee as required by Section 3745.11(C) of the Ohio Revised Code. This fee is payable fifteen days after the date of final issuance of the permit.

Before any review of plans can be initiated, all applicable fees, required forms (completely filled out - indicate N/A where appropriate), and letters must be received by the appropriate District Office. The submittal package must contain:

- I. The appropriate fees (Item 11, page 4).
- II. Two copies of pages 1, 2 and 3 of the permit to install application (Ohio EPA form 4309).
- III. Detailed plans (Item 9a, page 2).
- IV. Data sheets (Item 9b, page 2, if appropriate).
- V. Special submittals (Item 9c, page 3, if appropriate).
- VI. Detailed information (Item 13, a-m, pages 4 and 5, if appropriate).

Applications for both permits to install and plan approvals shall be signed on page 3 in accordance with OAC 3745-31-04. For any type combined PTI application, contact the district representative.

Applications for permits to install (wastewater) shall be signed on page 3:

- (1) In the case of a corporation, by a principal executive officer of at least the level of vice-president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility;
- (2) In the case of a partnership, by a general partner;
- (3) In the case of sole proprietorship, by the proprietor; and
- (4) In the case of a municipal, state, federal or other governmental facility, by the principal executive officer, the ranking elected official, or other duly authorized employee.

Applications for plan approval (wastewater) for the land application of sludge, sludge management or animal waste, shall be signed on page 3 by either the president, vice-president, or highest ranking corporate officer with offices located in the state, or the owner of the entity planning to apply the sludge. In case of a publicly owned treatment plant, the application shall be signed by the highest elected official of the municipality from which the sludge is generated.

The signatures shall constitute personal affirmation that all statements or assertions of fact made in the application are true and complete, comply fully with applicable state requirements, and shall subject the signatory to liability under applicable state laws forbidding false or misleading statements.

OHIO ENVIRONMENTAL PROTECTION AGENCY
Division of Water Pollution Control
Application for Permit to Install or Plan Approval

210 E. Aurora Rd.
Tainsburg, Ohio, 44087-1171
(216) 425-1171
Attn: Regan Williams

- ☒ Treatment Works (Includes Septic Systems)
☒ New Source (1)
☐ Modification (1) and (2)
☐ Pretreatment Only
☐ Sludge or Waste Management Plan Approval
☐ Other (Sewers, Pump Stations, Fly Ash or Bottom Ash Disposal Site, etc.) (2)

For Office Use Only	
Application No.	_____
Date Received	_____
PAID	
Amount	_____
Date	_____
Check #	_____
Date	_____

1. a) Owner Summit National Facility Trust (SNFT)
b) Applicant (per OAC 3745-1-04, See General Instructions).
Responsible Official Gary Gifford Title Chairman SNFT
Firm 76 The Goodyear Tire & Rubber Co. Telephone (419) 776-1546
Mailing Address 1199 East Market St., Akron, Ohio 44316-0001
c) Name of Project/Facility Groundwater Treatment Facility
Location (List street/road address, township and county, or latitude and longitude if possible. Otherwise provide legal description) Summit National Superfund Site, South-East corner of intersection of Ohio Route 225 & US Route 224 in Deerfield Township of Portage County, Ohio
d) Receiving Stream or Treatment Works to Receive Wastewaters North-East Drainage Ditch
e) Person to Contact (Person most familiar with the technical aspects of the project.)
Name Jack Michels Title Project Manager
Organization Conestoga-Powers & Associates Telephone (517) 725-3313
f) Operator of facility Summit National Facility Trust
a) Reason for project: Groundwater remediation

- b) Is this facility regulated under an effective NPDES Permit? Y N Permit # _____
c) Is this application filed in compliance with Y N Ohio EPA Findings and Orders or a Consent Order* X Y Date: June 11, 1991
*If the answer is yes, fill in the effective date of the Finding and Orders.

(1) If the treatment works or modification of treatment works involves the construction of any type of lagoon (non-concrete lined) other than a flow equalization lagoon, then a hydrogeologic site investigation report, meeting the requirements given in Detailed Information, Item 13. m, page 5, must be submitted with this application.

(2) For modifications, additions, or replacement of existing works.

3. a) Designed by: Conestoga - Rovers & Associates
 b) Address: O'HARE Corporate Towers One Phone: (519) 725-3313
10400 West Higgins Road, Suite 103, Rosemont, IL 60018
 c) Inspection Responsibility: Conestoga - Rovers & Associates
 d) Address: As Above Phone: (519) 725-3313

4. Project Costs: \$ _____ (_____ estimated _____ bid _____ invoiced)
 (Amount) (Check one)

5. Estimated schedule

- a) Construction: begin _____ complete _____
 b) Operation: start _____ compliance _____

6. a) This new system has been designed for 0.06 MGD average flow.
~~b) This existing system has been modified for additional _____ MGD average flow.~~
~~c) This existing system has been modified to comply with effluent limits in Item 7.~~

7. Design performance criteria (use attachment if necessary)

Parameter	Units	30 Day Average	7 Day Average	Maximum
<u>See Attachment A, 13 f)</u>				

8. Facility type: X new _____ modify _____ replace

- a) _____ Pretreatment(*)
 b) _____ Industrial Direct Discharger(*)
 c) _____ Livestock Management Plan
 d) _____ Public
 _____ Treatment Works(*)
 _____ Sanitary Sewers
 _____ Pump Station
 _____ Land Application of Sludge (Plan Approval Only)
 e) X ~~Semi-Public, Private or Commercial(*)~~
 (*) Part 9d. must be completed

9. Plan Submitted should include (to be attached to the application)

- a) X Detail Plans 3 sets; consult with the appropriate District Office)
 X Construction Drawings
 X Specifications
 X Site Plan
 X Vicinity Map
 X Schematic diagrams
 b) _____ Data Sheets (as appropriate)
 _____ Sanitary Sewer Data Sheet (sanitary sewers only)
 _____ Pump Station Data Sheet (pump stations)
 _____ Appendix G (long or short as appropriate)
 _____ Wastewater Treatment Works-General Information (EPA Form 8003)

(Continued)

c) Special submittals (as appropriate)

- ☐ Approval letter from municipality (pretreatment only)
- ☐ NPDES Application (direct discharges)
- ☐ PUCO certification (Facilities Subject to Regulation by the Public Utilities Commission)
- ☐ Soil Analysis
- ☐ Groundwater Geologic Evaluation
- ☐ Livestock Waste Management Plan
- ☐ Certificate of Supervision for installation, and operation of Package Sewage Treatment Plant
- ☐ Engineering Report
- ☒ Other: • Remedial Construction Work Plan
• Final Design Report

d) Operation and Maintenance Costs

Please provide the best possible estimate of the annual operation and maintenance cost of the new or modified facility. For modified facilities the operation and maintenance costs for the entire facility, not for just the modified portions are required. For publicly owned wastewater treatment facilities include the operation and maintenance costs of the sewer system. Provide as much detail as possible. Assume that the facility/system is operating at design flow/loading.

\$1,000,000 including Site personnel, groundwater treatment system power consumption and chemical usage and carbon replacement; sludge disposal; and sampling and monitoring costs.

29. Under OAC 3745-31-04, these signatures shall constitute personal affirmation that all statements or assertions of fact made in the application and attachments thereto are true and complete, comply fully with applicable state requirements, and shall subject the signatory to liability under applicable state laws forbidding false or misleading statements.

Authorized Signature (of facility) * ** Date

Title

Address

For Wastewater
Treatment Plants:

Signature of Engineer preparing plans.* Date

Company

Address

* Photostatic copies of signatures are not acceptable.

** Signature of owner or responsible official of applying company required. (See OAC 3745-31-04)

ATTACHMENT A

**INFORMATION REQUIREMENTS FOR ITEM 13
PERMIT TO INSTALL
SUMMIT NATIONAL SUPERFUND SITE
DEERFIELD TOWNSHIP OF PORTAGE COUNTY, OHIO**

13 a)

No service or product is being provided. As required by the Consent Decree for the Summit National Superfund Site, a groundwater treatment system will be installed as part of the Remedial Action for the Site. The groundwater treatment system will consist of an aeration unit, a biotower unit, a sand filter unit, a liquid phase carbon adsorption unit, and a sludge dewatering unit, all as described in the Final Design Report and the Remedial Construction Work Plan. As provided for in the Consent Decree, discharge of the treated groundwater will be to adjacent off-Site drainage ditches.

13 b)

- steady state groundwater influent flow rate of 36 to 42 gallons per minute (gpm) with a 100 gpm maximum;
- 20% NaOH solution caustic pH adjustment, 150 gallons per day (gpd) design;
- 32% HCl solution acid pH adjustment, 57 gpd design;
- potassium phosphate and ammonium chloride biotower nutrients, 144 gpd (total) design;
- vapor phase activated carbon, approximately 4,000 pounds per year;
- liquid phase activated carbon, approximately 100,000 pounds per year; and
- dewatered sludge, approximately 450 pounds per day.

13 c)

This is a new installation and this application is being submitted to ascertain that all applicable or relevant and appropriate requirements are being satisfied for the long term discharge of treated groundwater to adjacent off-Site drainage ditches.

13 d)

No.

13 e)

Not applicable.

13 f)

13 g)

Treated groundwater will be discharged to drainage ditch at the northeast boundary of the Site. Sludge will be characterized and disposed in a sanitary or secure landfill as appropriate.

13 h)

See 13 f)

13 i)

Not applicable.

13 j)

Not applicable.

13 k)

The treated groundwater, air discharge and the sludge will be regularly sampled and analyzed as described in Section 8 of the Draft Operation, Maintenance and Monitoring Plan (Appendix L of the Remedial Construction Work Plan).

13 l)

Not applicable.

13 m)

Not applicable.

**ESTIMATED WATER AND AIR DISCHARGE CONCENTRATIONS
GROUNDWATER TREATMENT SYSTEM
SUMMIT NATIONAL SUPERFUND SITE**

<i>Chemical</i>	<i>Maximum Estimated Influent (1) Concentration (µg/L)</i>	<i>Estimated Effluent (1) Concentration (µg/L)</i>	<i>Air concentrations at Stack (2)</i>	
			<i>Aeration Effluent at 100 cfm (µg/m3)</i>	<i>Biotower Effluent at 170 cfm (µg/m3)</i>
<u>Volatile Organic Compounds</u>				
*Acetone	46,347	927	6,508.6	114.9
Benzene	7	ND(3)	3.7	0.001
1,1-Dichloroethane	359	7	191.6	0.059
1,2-Dichloroethane	1,049	21	559.8	0.173
1,1-Dichloroethylene	2	ND	1.1	0.0003
1,2-Dichloroethylene	1,223	24	652.6	0.202
Ethylbenzene	26	1	13.9	0.004
Methylene Chloride	145	3	77.4	0.24
*Methyl Ethyl Ketone	22,103	442	3,103.9	54.8
Methyl Isobutyl Ketone	756	15	403.4	0.125
Toluene	260	5	138.7	0.043
1,1,1-Trichloroethane	602	12	321.3	0.099
Trichloroethylene	1.5	ND	0.8	0.0002
Xylene (Total)	289	6	154.2	0.048
<u>Base/Neutral Compounds</u>				
*Benzoic Acid	309	6	43.4	0.8
Bis(2-Ethylhexyl)Phthalate	1	ND	0.1	0.003
Isophorone	38	1	5.3	0.1
2-Methyl Naphthalene	1	ND	0.1	0.003
Naphthalene	1	ND	0.1	0.003
<u>Acid Compounds</u>				
4-Chloro-3-Methyl Phenol	2	ND	0.3	0.005
2,4-Dimethyl Phenol	1	ND	0.1	0.003
2-(O-Cresol) Methyl Phenol	3	ND	0.4	0.007
4-(P-Cresol) Methyl Phenol	20	ND	2.8	0.05
Phenol	158	3	22.2	0.4

**ESTIMATED WATER AND AIR DISCHARGE CONCENTRATIONS
GROUNDWATER TREATMENT SYSTEM
SUMMIT NATIONAL SUPERFUND SITE**

<i>Chemical</i>	<i>Maximum Estimated Influent (1) Concentration (µg/L)</i>	<i>Estimated Effluent (1) Concentration (µg/L)</i>	<i>Air concentrations at Stack (2)</i>	
			<i>Aeration Effluent at 100 cfm (µg/m3)</i>	<i>Biotower Effluent at 170 cfm (µg/m3)</i>
<u>Filtered Inorganic Compounds</u>				
Antimony	5	5	—	—
Arsenic	7	7	—	—
Iron	149,691	300 (soluble)	—	—
Aluminum	536	536	—	—
Barium	219	219	—	—
Calcium	403,571	201,785	—	—
Chromium VI	5	5	—	—
Cobalt	14	14	—	—
Copper	2	2	—	—
Lead	1	1	—	—
Magnesium	144,301	72,151	—	—
Manganese	6,818	6,818	—	—
Nickel (Soluble Salts)	14	14	—	—
Potassium	12,829	6,415	—	—
Zinc	188	188	—	—

Notes:

- (1) Reproduced from Table 6.2, Pre-Final Design Report, Volume I.
- (2) Based on 42 gpm design groundwater influent flow rate; aeration treatment providing 95% removal of volatiles and 25% removal of acetone and methyl ethyl ketone and semi-volatiles; biotower treatment providing 99% removal of all compounds; and vapor phase carbon providing 99% removal efficiency.
- (3) ND = Non Detect

SECTION 2

APPLICATION FORM

AIR DISCHARGE PERMIT TO INSTALL

**AKRON REGIONAL AIR QUALITY DIVISION
OHIO ENVIRONMENTAL PROTECTION AGENCY**

OHIO ENVIRONMENTAL PROTECTION AGENCY
APPLICATION FOR A PERMIT TO OPERATE
AN AIR CONTAMINANT SOURCE

Akron Regional Air Quality
Management District
177 S. Broadway
Akron, Ohio 44308
Attn: Frank Markunas
tel (216) 375-2460

Summit National Superfund Site

Facility Name

Jack Michels

Person to Contact

Conestoga - Rogers & Associates
15400 West Higgins Rd., Suite 103

South East Corner Ohio Route 225 & US Route 224

Facility Address

Mailing Address

Deerfield Township, Portage County

Rosemont OH

44018

City County Zip

City State Zip

c/o Mr. Gary Cottard, Goodyear Tire &
Rubber Co. (216) 796-1348

(514) 725-3313

Telephone Area Number

Telephone

(Application No., if this is a renewal application) Std. Ind. Class. Code

1. Complete and attach any of the following appendices most appropriate to the air contaminant source. In addition, a compliance time schedule form is to be attached when applicable. Check as appropriate the following:

<input checked="" type="checkbox"/> Appendix A, Process	<input type="checkbox"/> Appendix L, Solvent Metal Cleaning
<input type="checkbox"/> Appendix B, Fuel-Burning Equipment	<input type="checkbox"/> Appendix M, Fugitive Dust Emission Sources
<input type="checkbox"/> Appendix C, Incinerator	
<input type="checkbox"/> Appendix D, Surface Coating or Printing Operation	
<input type="checkbox"/> Appendix E, Storage Tank	<u>Specify Appendix No.</u>
<input type="checkbox"/> Appendix H, Gasoline Dispensing Facility	<input type="checkbox"/> Appendix N, Rubber Tire Manufacturing
<input type="checkbox"/> Appendix J, Loading Rack at Bulk Gasoline Plant or Terminal	<input type="checkbox"/> Appendix O, Dry Cleaning Facility
<input type="checkbox"/> Appendix K, Surface Coating Line or Printing Line	<input type="checkbox"/> Appendix P, Landfills
	<input type="checkbox"/> Other Appendix
	<input type="checkbox"/> Compliance Time Schedule

2. Description of Source (same as used on appendix): Groundwater Treatment System
3. Your identification for Source (same as used on appendix): Air emissions from aeration and biological treatment units vented through activated carbon

I, being the individual specified in Rule 3745-35-02(B) of the Ohio Administrative Code, hereby apply for a Permit to Operate the air contaminant source(s) described herein. As required, the following additional documents are submitted as part of this application (describe all attachments):

Authorized Signature*

Title

Date

*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

These instructions concern the completion of application materials for a Permit to Operate or a Variance for air contaminant sources. An application cannot be considered unless the application form is completed and signed and any required supplemental information is submitted. Pursuant to Section 3745.11(G) of the Ohio Revised Code (ORC), any person applying for a permit to operate, permit to install, or variance must pay a non-refunderable application fee \$15.00. This fee must be submitted at the time of application. Make checks payable to the Treasurer of the State of Ohio. Unless otherwise provided for by rule, a separate application must be filed for each air contaminant source. Therefore, only one (1) appendix may accompany this form. Applicants are advised that they will be required to pay a fee upon approval of their application for a Permit to Operate or Variance as provided for in Section 3745.11(B) of the ORC.

An appendix is a technical information form to be completed by the applicant. From the following description of the appendices, determine which should accompany your application.

- Appendix A - Process: for sources not included in the other appendices.
- Appendix B - Fuel-Burning Equipment: for any furnace, boiler, apparatus, and all appurtenances thereto, used in the process of burning fuel with the primary purpose of producing heat or power by indirect heat transfer.
- Appendix C - Incinerator: for any equipment, machine, device, article, contrivance, structure or part of a structure used to burn refuse or to process refuse material by burning other than by open burning.
- Appendix D - Surface Coating or Printing Operation: for a surface coating operation not included under Appendix K or for a printing operation.
- Appendix E - Storage Tank: a storage tank for petroleum liquids.
- Appendix H - Gasoline Dispensing Facility: any site where gasoline is dispensed to motor vehicle gasoline tanks from stationary storage tanks.
- Appendix J - Loading Rack at a Bulk Gasoline Plant or Terminal: an operation for transferring gasoline to a delivery vessel.
- Appendix K - Surface Coating Line: a coating line consists of one or more coating applicators, flash-off areas or ovens to be used for the following: an automobile or light-duty truck assembly plant; can manufacturing; coil-coating; fabric coating; large appliance coating; magnet wire coating; metal furniture coating; paper coating; vinyl coating.
- Appendix L - Solvent Metal Cleaning: an operation employing solvent for cleaning metal surfaces; wipe-cleaning is excluded.
- Appendix M - Fugitive Dust Emission Sources

General:

- | | |
|---|---|
| M1-1 - Plant Roadways and Parking Areas | M13 - Cement Manufacturing and Blending Plants |
| M1-2 - Aggregate Storage Piles | M14 - Ferroalloy Production |
| M1-3 - Material Handling | M15 - Metal Salvage Operations |
| M1-4 - Mineral Extraction | M16 - Pulp and Paper Mills |
| | M17 - Woodworking Operations |
| | M18 - Aggregate Processing Plans |
| | M19 - Coal Processing Plants |
| | M20 - Brick and Related Clay Product Manufacturing Plants |
| | M21 - Asphaltic Concrete Plants |
| | M22 - Concrete Batching Plants |

Iron and Steel Mills:

- M2-1 - Coke Manufacturing
- M2-2 - Iron Production
- M2-3 - Steel Manufacture

- M3 - Lime Plants
- M4 - Power Plants

M5 - Grain Terminals	M23 - Sandblasting Operations
M6 - Country Grain Elevators	M24 - Petroleum Refineries
M7 - Gray Iron Foundries	M25 - Agricultural Chemical Manufacturing Plants
M8 - Steel Foundries	M26 - Bulk Gasoline Terminals and Plants
M9 - Glass Manufacturing Plants	M27 - Carbon Black Plants
M10 - Fiberglass Manufacturing	M28 - Municipal Incineration
M11 - Secondary Aluminum Processing Plants	M29 - Salt Processing Operations
M12 - Fertilizer Mixing/Blending Plants	M30 - Galvanizing Plants

Appendix N - Rubber Tire Manufacturing

Appendix O - Dry Cleaning Facility

Appendix P - Landfill

There are separate instructions with each appendix. If more than one application form is submitted at one time, it is acceptable to use photocopies of these forms containing identical data entry; however, each application must contain an original signature.

The following Sections of Chapter 3745-35 of the Ohio Administrative Code provide the applicant with information regarding air contaminant sources, permits to operate and variances. A complete copy of OAC Rule 3745-35 is available upon request.

OAC Rule 3745-35-01(B)(1) "Air Contaminant Source" shall mean any machine, device, apparatus, equipment, building, or other physical facility that emits or may emit any air pollutant.

OAC Rule 3745-35-02(A) Except as otherwise provided in Parargraph (H) of this rule and in rules 3745-35-03 and 3745-35-05 of the Administrative Code, no person may cause, permit, or allow the operation or other use of any air contaminant source without applying for and obtaining the permit to operate from the Ohio Environmental Protection Agency in accordance with the requirements of this rule.

OAC Rule 3745-35-03 (A) No person shall cause, permit or allow the operation or other use of any air contaminant source that emits any air pollutant in violation of any applicable air pollution control law, unless a variance has been applied for and obtained from the director for such source, pursuant to the provisions of this rule. No variance from any rule of the director adopted under Chapter 3704 of the Revised Code may be issued except pursuant to this rule.

Signature on Application Form:

OAC Rule 3745-35-02(B)(1) Applications for permits to operate shall be signed, in the case of a corporation, by a principal executive officer of at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the emission described in the application originates.

(2) Applications for permits to operate shall be signed, in the case of partnership, by a general partner.

(3) Applications for permits to operate shall be signed, in the case of sole proprietorship, by the proprietor.

(4) Applications for permits to operate shall be signed, in the case of municipal, state, federal or other governmental facility, by the principal executive officer, the ranking elected official, or other duly authorized employee.

OAC Rule 3745-35-03(D)(1) Application for variances shall be signed in the case of a corporation, by a principal executive officer or at least the level of vice president, or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the emission described in the application originates.

(2) Applications for variances shall be signed in the case of a partnership by a general partner.

(3) Applications for variances shall be signed in the case of a sole proprietorship, by the proprietor.

(4) Applications for variances shall be signed in the case of municipal, state, federal or other government facility, by the principal executive officer, the ranking elected official, or other duly authorized employee.

INSTRUCTION FOR APPENDIX A - PROCESS

Appendix A is a general appendix and should be completed for a source operation for which there is no specific appendix. Refer to the listing of appendices in the instructions to the Permit to Operate/Variance application to determine if another one applies (e.g. Appendix B - Fuel Burning Equipment, Appendix C - Incinerator, Appendix D - Surface Coating or Printing Operation, Appendix E - Storage Tank/Loading Facility, or others).

Rule 3745-15-01(X) of the Ohio Administrative Code defines a "source operation" as "... the last operation preceeding emission which operation: (1) results in the separation of the air contaminant from the process materials or in the conversion of the process materials into air contaminants, as in the case of combustion fuel; and, (2) is not an air pollution abatement operation."

General Instructions: Answer or complete all items. If the item does not apply to the source operation write in "not applicable" or "NA". If the answer is not known write in "not known" or "NK". The appendix form may be returned to you if all items are not completed or answered.

Specific Instructions:

Item Process Data: Items (1) thru (6) refer to general process information.

- (1) Complete the generally accepted name for the process (e.g. asphalt batching, glass manufacturing, oil refining, electroplating, rendering, etc.).
- (2) Specify the end product of this process (e.g. asphaltic concrete, glassware, benzene, chrome plated bumpers, soaps, etc.).
- (3) Name the specific process equipment for this appendix along with the company's identifying name or code and the year it was or will be installed (e.g. basic oxygen furnace - furnace #1 - 1965).
- (4) Name the manufacturer and model number (if any) of the process equipment in item (3).
- (5) State the "rated" (normal) and (maximum) capacity, in pounds per hour (lbs/hr), of the process equipment. The capacity refers to the input capacity of materials entering the process equipment.
- (6) Indicate the method of exhaust ventilation and indicate if there are more than one exhaust.

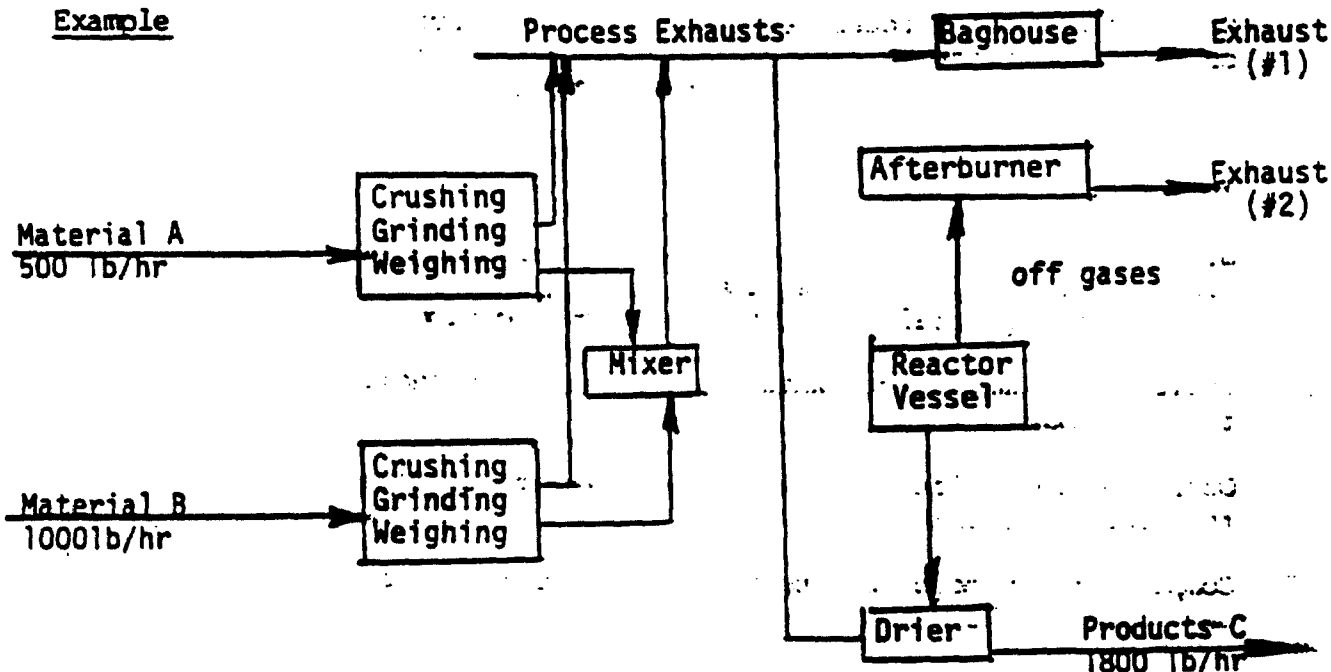
Operating Data: Items (7) thru (14) refer to the operating information for the process equipment.

- (7) Complete the process equipment's normal operating schedule in hours per day, days per week, and weeks per year.
- (8) Complete the percent annual production by season for a years production of finished units. The four seasons should total to 100% and include: Winter (December, January, February), Spring (March, April, May), Summer (June, July, August), Fall (September, October, November).

Item

- (9) Specify the average and maximum hourly production rates in pounds. The average is the years production rate divided by the total yearly hours of production or operation.
- (10) Specify the annual production for this process, equipment and indicate the appropriate units (e.g. 10,000 tons of steel, 150,000 barrels of benzene, etc.). Estimate the annual increase in production.
- (11) Check whether the process is continuous or batch. A batch operation normally has significant down time between completion and startup of each operation or cycle. If batch, complete the minutes per production cycle, and minutes between the production cycles. A "cycle" refers to the time equipment is in operation.
- (13) List all general types of raw materials employed in the process, indicate the principle use (i.e., product, binder, catalyst, fuel, etc.) and specify the normal amount used in pounds per hours (lbs/hr). List any specific materials containing lead, asbestos, beryllium, or mercury.
- (14) A process flow diagram is to be included with this appendix and should be sketched on a separate sheet. The diagram should include:
- (a) Entry and exit points of all raw materials, intermediate products, by-products, and finished products.
 - (b) Labelling of all materials (products, waste, and airborne contaminants).
 - (c) Labelling of process equipment and controlling equipment:

Example



Item

Control Equipment: Items (15)(a) thru (j) refer to the control equipment information.

- (15) Complete items (a) thru (j) for any air pollution device or equipment related to the process equipment of this appendix. The primary collector and secondary collector refer to separate control devices or equipment collecting similar or different air pollutants. If there is a third collector, complete the same data for that collector on a separate sheet. Additional information (e.g., drawings, design data, etc.) may be attached to this appendix.
- (a) Insert the control equipment code letter.
 - (b) Name the manufacturer of the control equipment.
 - (c) Name the manufacturer's model number (if any).
 - (d) Fill in the year the control was or will be installed.
 - (e) Fill in the company's identifying name or number for the control device or equipment.
 - (f) Specify only the pollutant (air contaminant) controlled.
 - (g) Specify the controlled pollutant emission rate if known or measured in pounds per hour (lbs/hr) or grains per standard cubic foot dry (g/scfd) or other appropriate units. Specify units.
 - (h) Specify the pressure drop, in inches H₂O, across the collector.
 - (i) Specify the design collection or removal efficiency of the collector for the controlled pollutant.
 - (j) Specify the operating collection or removal efficiency of the collector for the controlled pollutant. The operating efficiency is normally determined from a stack test.

Stack Data: Items (16) thru (22) refer to information for the stack exhaust of this process.

- (16) Indicate the company's identification for the stack or exhaust.
- (17) If other sources are also vented to this same stack or exhaust indicate so and identify those sources.
- (18) Specify the inside dimensions of the stack or exhaust at the outlet to the atmosphere.
- (19) Specify the stack's or exhaust's height, in feet (ft.) above ground and above the attached roof.
- (20) For the stack's or exhaust's exit gas complete the temperature in degrees Fahrenheit (°F), the volume flow rate in actual cubic feet per minute (ACFM), and the velocity in feet per minute (ft/min.). If the properties of the exit gas vary use the average values.
- (21) Indicate if the stack or exhaust is equipped with air pollution monitoring equipment and if so specify the type, manufacturer, make or model, and pollutant or pollutants monitored.
- (22) If air pollution emissions for this process have been determined and data is included with (attached to) this appendix indicate so and check the method of determination (i.e. stack test, emission factor, or material balance). The stack test may be from either this reported process or a similar one located elsewhere. The emission factor calculation and determination factor should include a reference to the process emission factor and data relative to the collection or removal efficiency of control equipment. The material balance method should include methods and a flow diagram.

Completed by and Date: Write in the name of the person completing the form and the date.

FOR OFFICIAL USE ONLY

Premise No. _____
Source No. _____

APPENDIX A, PROCESS

PROCESS DATA

1. Name of process Groundwater Treatment System
2. End product of this process Treated Groundwater
3. Primary process equipment Aeration Tank, Biological Treatment Unit
Your identification _____ Year Installed _____
4. Manufacturer _____ Make or Model _____
5. Capacity of equipment ^{gallons/min} (lbs./hr): Rated 50 Max. 50
6. Method of exhaust ventilation: ☐ Stack ☐ Window fan ☐ Roof vent
☒ Other, describe side wall
Are there multiple exhausts? ☒ Yes ☐ No
(2) - one for aeration, one for biological treatment

OPERATING DATA

7. Normal operating schedule: 24 hrs./day, 7 days/wk., 52 wks./year.
8. Percent annual production (finished units) by season:
Winter 25 Spring 25 Summer 25 Fall 25
9. Hourly production rates ^{gallons} (lbs.): Average 2000 Maximum 6000
10. Annual production (indicate units) 22,075,200 gallons
Projected percent annual increase in production NA
11. Type of operation: ☒ Continuous ☐ Batch
12. If batch, indicate Minutes per cycle _____ Minutes between cycles _____
13. Materials used in process:

List of Raw Materials	Principal Use	Amounts (lbs./hr.)
20% NaOH	pH adjustment	150 gallons/day
32% HCl	pH adjustment	57 gallons/day
potassium phosphate	bioreactor nutrient	500 gallons/day
ammonium chloride	bioreactor nutrient	72 gallons/day
vapor activated carbon	air treatment	4,000 lbs/year
liquid activated carbon	water treatment	100,000 lbs/year

14. A PROCESS FLOW DIAGRAM MUST BE INCLUDED WITH THIS APPENDIX. Show entry and exit points of all raw materials, intermediate products, by-products and finished products. Label all materials including airborne contaminants and other waste materials. Label the process equipment and control equipment. See Section 2, Draft Operation, Maintenance and Monitoring Plan (Appendix K of Remedial Construction Work Plan).
(continued on reverse side)

CONTROL EQUIPMENT

Control Equipment Codes:

- | | | |
|--------------------------------|--------------------------|-----------------------------|
| (A) Settling chamber | (G) Cyclonic scrubber | (M) Adsorber |
| (B) Cyclone | (H) Impingement scrubber | (N) Condenser |
| (C) Multiple cyclone | (I) Orifice scrubber | (O) Afterburner - catalytic |
| (D) Electrostatic precipitator | (J) Venturi scrubber | (P) Afterburner - thermal |
| (E) Fabric filter | (K) Plate or tray tower | (Q) Other, describe |
| (F) Spray chamber | (L) Packed tower | <u>Carbon Adsorber</u> |

15. Control Equipment data:

CARBON ADSORBER VESSELS

Item	Primary Collector <u>Aeration Tank</u>	Secondary Collector <u>Bioreactor</u>
(a) Type (See above code)	<u>Q</u>	<u>Q</u>
(b) Manufacturer		
(c) Model No.	<u>2000 lb carbon</u>	<u>2,000 lb carbon</u>
(d) Year installed		
(e) Your identification		
(f) Pollutant Controlled	<u>Volatiles Organic Compounds</u>	<u>Volatiles Organic Compounds</u>
(g) Controlled pollutant emission rate (if known)	<u>see Table 1</u>	<u>see Table 1</u>
(h) Pressure drop		
(i) Design efficiency	<u>99%</u>	<u>99%</u>
(j) Operating efficiency	<u>99%</u>	<u>99%</u>

STACK DATA

16. Your stack identification # 1 (Carbon Adsorber) # 2 (bioreactor)
17. Are other sources vented to this stack: ☐ Yes ☒ No
If, yes, identify sources _____
18. Type: ☒ Round, top inside diameter dimension ~ 10 inches
☐ Rectangular, top inside dimensions (L) _____ x (W) _____
19. Height: Above roof _____ ft., above ground ~ 10 ft.
20. Exit gas: Temp. ~ 70 °F, Volume 100-170 ACFM, Velocity _____ ft./min.
21. Continuous monitoring equipment: ☐ Yes ☒ No
If yes, indicate: Type _____, Manufacturer _____
Make or Model _____, Pollutant(s) monitored _____
22. Emission date: Emissions from this source have been determined and such data is included with this appendix:

If yes, check method: ☐ Stack Test ☐ Emission factor ☐ Material Balance

Completed by _____, Date _____

Table 1

(from water permit to install)

13 f)

TREATMENT SYSTEM WATER AND A DISCHARGE
ESTIMATED FIRST GROUNDWATER TREATABILITY STUDY
~~INFLUENT AND EFFLUENT CONCENTRATIONS AND LOADINGS~~
SUMMIT NATIONAL SUPERFUND SITE

(B)

Contaminant	GROUNDWATER Estimated Concentrations (mg/L)			Estimated Effluent Loading (lb/day)	
	Influent (1)	Effluent, 100		At 5 gpm	At 10 gpm
		At 10 gpm			
		At 10 gpm			
Volatiles					
Methylene Chloride	3.31	0.005	0.005	0.0003	0.0006
Acetone	140.77	7.2	102.8	4.3	12.3
1,1-Dichloroethane	1.982	<2.4	<4.4	<0.14	<0.29
1,2-Dichloroethane	31.21	0.005	0.005	0.0003	0.0006
2-Butanone	106.628	32.8	60.1	1.9	7.2
1,1,1-Trichloroethane	8.449	<0.2	<0.2	<0.012	0.024
Trichloroethene	4.597	0.005	0.005	0.0003	0.0006
4-Methyl-2-Pentanone	9.128	0.6	1.3	0.037	0.178
Toluene	3.496	<1.0	<1.0	<0.06	<0.12
Ethylbenzene	1.179	<0.7	<0.7	<0.04	<0.08
Semi-Volatiles					
4-Methylphenol	0.08	<0.08	<0.08	<0.0048	<0.0096
2,4-Dimethylphenol	0.018	<0.04	<0.4	<0.024	<0.048
Phenol	1.295	0.02	0.02	0.0012	0.0024
Isophorone	0.520	<1.05	<1.05	<0.063	0.126
Naphthalene	0.089	0.01	0.01	0.0006	0.0012
2-Methylnaphthalene	0.058	<0.058	<0.058	<0.0035	<0.0070
Bis(2-ethylhexyl)Phthalate	1.017	<0.014	<0.014	0.0008	0.0017

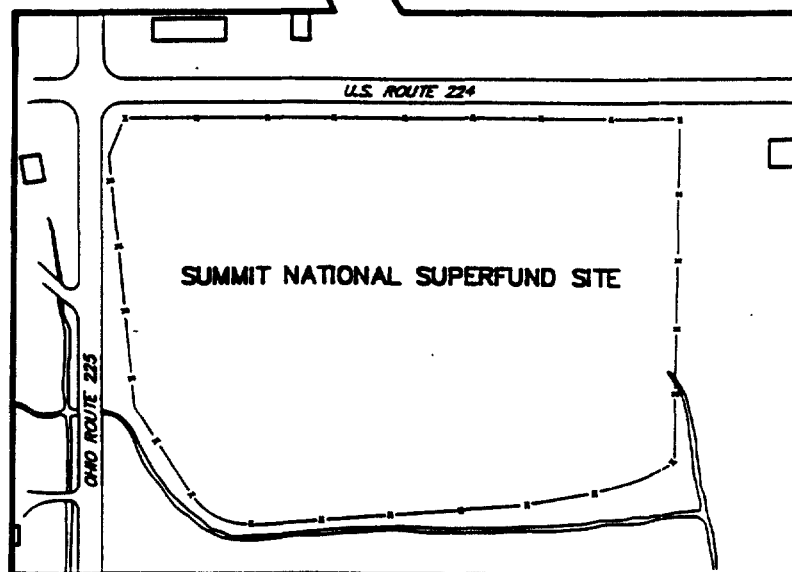
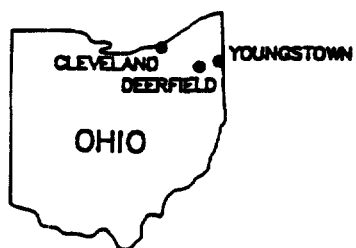
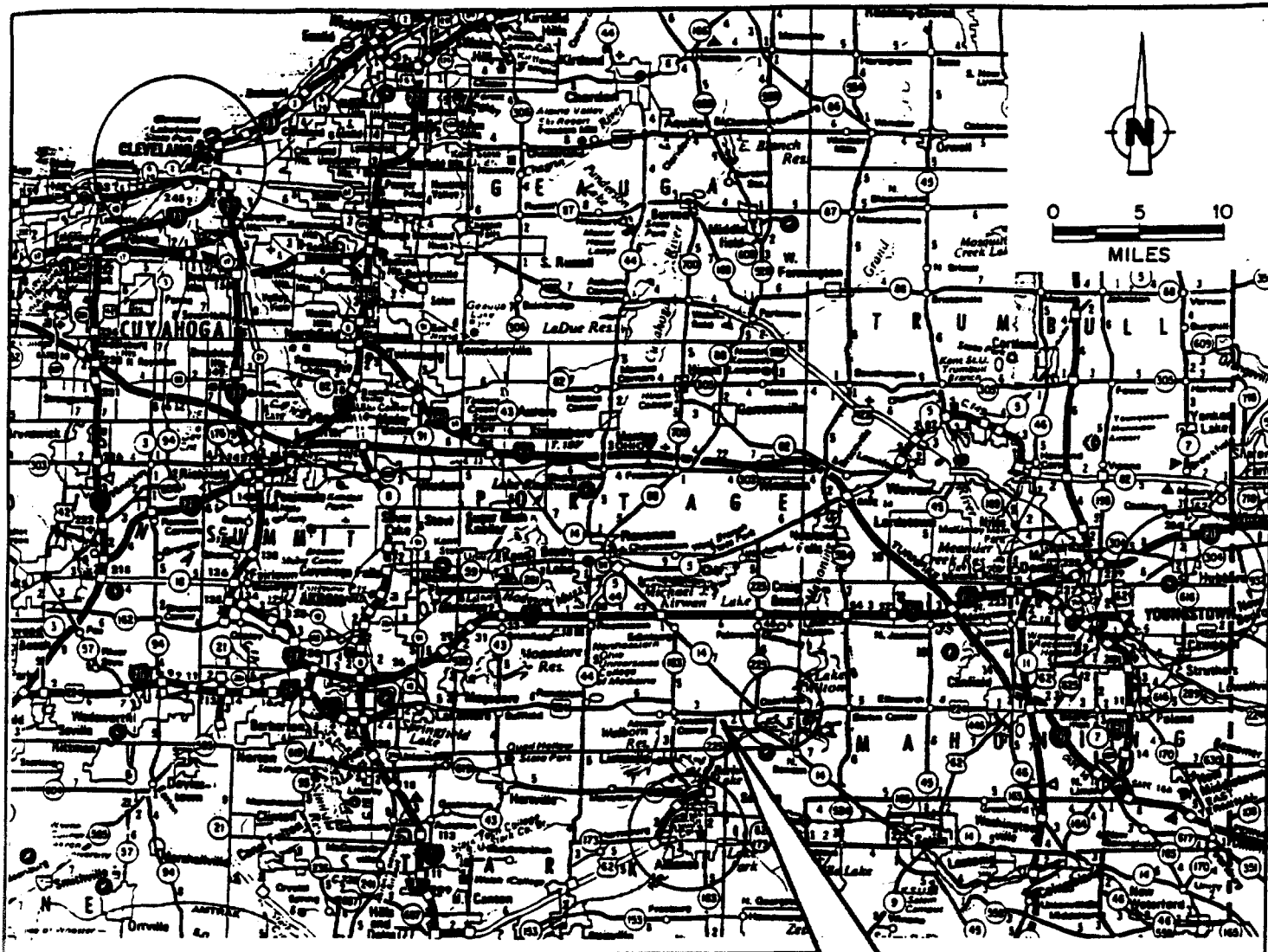
Note (1) Reproduced from Table 2, Appendix D of the Statement of Work.

A secondary carbon contactor will be provided to permit direct discharge of the treated groundwater

13 g)

Only treated groundwater will be discharged from the site. Sludge ~~will be collected and secured on site for disposal during the remedial action.~~ Sludge will be characterized and disposed in a sanitary or secure landfill as appropriate.

to drainage ditch at the northeast boundary of the site



SOURCE: OHIO OFFICIAL TRANSPORTATION MAP, 1987

figure A

SITE LOCATION
SUMMIT NATIONAL SUPERFUND SITE
Deerfield Township of Portage County, Ohio

CRA

TABLE 1

**ESTIMATED WATER AND AIR DISCHARGE CONCENTRATIONS
GROUNDWATER TREATMENT SYSTEM
SUMMIT NATIONAL SUPERFUND SITE**

<i>Chemical</i>	<i>Maximum Estimated Influent (1) Concentration (µg/L)</i>	<i>Estimated Effluent (1) Concentration (µg/L)</i>	<i>Air concentrations at Stack (2)</i>	
			<i>Aeration Effluent at 100 cfm (µg/m3)</i>	<i>Biotower Effluent at 170 cfm (µg/m3)</i>
<u>Volatile Organic Compounds</u>				
*Acetone	46,347	927	6,508.6	114.9
Benzene	7	ND(3)	3.7	0.001
1,1-Dichloroethane	359	7	191.6	0.059
1,2-Dichloroethane	1,049	21	559.8	0.173
1,1-Dichloroethylene	2	ND	1.1	0.0003
1,2-Dichloroethylene	1,223	24	652.6	0.202
Ethylbenzene	26	1	13.9	0.004
Methylene Chloride	145	3	77.4	0.24
*Methyl Ethyl Ketone	22,103	442	3,103.9	54.8
Methyl Isobutyl Ketone	756	15	403.4	0.125
Toluene	260	5	138.7	0.043
1,1,1-Trichloroethane	602	12	321.3	0.099
Trichloroethylene	1.5	ND	0.8	0.0002
Xylene (Total)	289	6	154.2	0.048
<u>Base/Neutral Compounds</u>				
*Benzoic Acid	309	6	43.4	0.8
Bis(2-Ethylhexyl)Phthalate	1	ND	0.1	0.003
Isophorone	38	1	5.3	0.1
2-Methyl Naphthalene	1	ND	0.1	0.003
Naphthalene	1	ND	0.1	0.003
<u>Acid Compounds</u>				
4-Chloro-3-Methyl Phenol	2	ND	0.3	0.005
2,4-Dimethyl Phenol	1	ND	0.1	0.003
2-(O-Cresol) Methyl Phenol	3	ND	0.4	0.007
4-(P-Cresol) Methyl Phenol	20	ND	2.8	0.05
Phenol	158	3	22.2	0.4

**ESTIMATED WATER AND AIR DISCHARGE CONCENTRATIONS
GROUNDWATER TREATMENT SYSTEM
SUMMIT NATIONAL SUPERFUND SITE**

<i>Chemical</i>	<i>Maximum Estimated Influent (1) Concentration (µg/L)</i>	<i>Estimated Effluent (1) Concentration (µg/L)</i>	<i><u>Air concentrations at Stack (2)</u></i>	
			<i>Aeration Effluent at 100 cfm (µg/m3)</i>	<i>Biotower Effluent at 170 cfm (µg/m3)</i>
<u>Filtered Inorganic Compounds</u>				
Antimony	5	5	--	--
Arsenic	7	7	--	--
Iron	149,691	300 (soluble)	--	--
Aluminum	536	536	--	--
Barium	219	219	--	--
Calcium	403,571	201,785	--	--
Chromium VI	5	5	--	--
Cobalt	14	14	--	--
Copper	2	2	--	--
Lead	1	1	--	--
Magnesium	144,301	72,151	--	--
Manganese	6,818	6,818	--	--
Nickel (Soluble Salts)	14	14	--	--
Potassium	12,829	6,415	--	--
Zinc	188	188	--	--

Notes:

- (1) Reproduced from Table 6.2, Pre-Final Design Report, Volume I.
- (2) Based on 42 gpm design groundwater influent flow rate; aeration treatment providing 95% removal of volatiles and 25% removal of acetone and methyl ethyl ketone and semi-volatiles; biotower treatment providing 99% removal of all compounds; and vapor phase carbon providing 99% removal efficiency.
- (3) ND = Non Detect

SECTION 3

**APPLICATION FORM
BUILDING AND ELECTRICAL PERMIT**

**COUNTY OF PORTAGE
DIVISION OF BUILDING INSPECTION**

November __, 1992

Reference No. 2372-10

DRAFT

Mr. David Truax
County of Portage
Division of Building Inspection
449 South Meridian Street
Ravenna, Ohio 44266

Dear Mr. Truax:

Re: Building and Electrical Permit Application
Groundwater Treatment Facility
Summit National Superfund Site
Deerfield Township of Portage County, Ohio

On behalf of the Summit National Facility Trust, attached is the completed application for a Building and Electrical Permit (B&EP) for the groundwater treatment facility to be installed at the above Site as part of the Remedial Action activities to be implemented at the Site. The B&EP is being submitted to ascertain that all applicable or relevant and appropriate requirements will be satisfied as required by the Consent Decree. Details pertaining to the design and installation of the groundwater treatment facility are presented in the Final Design Report and the Remedial Construction Work Plan, respectively, for the above Site.

Should you have any questions or require additional information, please do not hesitate to contact the undersigned or the following remedial project managers:

Mr. Anthony Rutter
Director, Waste Management Division
Remedial Project Manager
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604
Tel: (312) 886-8961

Mr. Regan S. Williams
State Project Coordinator
Ohio EPA - Division of
Emergency & Remedial Response
2110 East Aurora Road
Twinsburg, Ohio 44087
Tel: (216) 425-9171

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Steve Whillier, B. Sc.

SW/ec/1

Encl.

c.c.: Anthony Rutter, USEPA
Peter Felitti, USEPA
Regan Williams, OEPA
Gary Gifford, SNFT
Jack Michels, CRA
Gerry Kestle, CRA

<input checked="" type="checkbox"/> Application For Plan Review	County of Portage Division of Building Inspection	Building Permit No. # _____
<input type="checkbox"/> Application For Commercial	444 South Meridian St.	Date: _____
<input checked="" type="checkbox"/> Application For Electrical	Ravenna, Ohio, 44266	Electric Permit No. # _____
<input type="checkbox"/> Life Safety Code Review Only	tel: 297-3530	Date: _____
<input type="checkbox"/> Special Inspection	Attn: David Truax	Plan Examiner: _____
<input type="checkbox"/> Sprinkler System Only		Date: _____
Zoning #: _____		Township: _____
Date: _____		Check No. # _____

Submit One Application For Each Building/Structure

Owner: Summit National Facility Trust
1144 East
 Address: The Goodyear Tire & Rubber Co. Market St.
 City: Akron State: Ohio
 Zip Code: 44316-0001 Telephone: 216-796-1348
 Parcel I.D. # _____

1. Basement _____
2. First Floor: 4600 ft²
3. 2,3,4,5,6, (Circle) _____
4. Additional Floors: _____
5. Total Square Ft.: 4600

Plans Prepared By: (Check One) Ohio Registered No. _____

- ☐ Ohio Registered Architect: _____
- ☐ Ohio Registered Engineer : _____
- ☐ Other: _____

Name Of Job And Describe Building Use: _____

Is This In An Incorporated City or Village? _____

Change of Occupancy, Addition, Alteration, New

Is Addition, Alteration or Change of Occupancy
 Provide Previous County Building Permit Number.

Permit Number: _____

Job Name: _____

Address: _____

City: _____ State: _____

Zip Code: _____ Telephone: _____

Estimated Cost: \$ _____

General Contractor: _____

Address: _____

City: _____ State: _____

Zip Code: _____ Telephone: _____

STRUCTURAL

- A. \$80.00 per Structure/Alteration: \$ _____
- B. \$ 2.00 per 100 Sq. Ft. \$ _____

ELECTRICAL

- A. \$80.00 per Structure/Alteration: \$ _____
- B. \$1.00 per 100 Sq. Ft. \$ _____

SPRINKLER FEES

- A. \$80.00 per Structure \$ _____
- B. \$ 2.00 per 100 Sq. Ft. \$ _____

INDUSTRIALIZED UNIT

- A. \$80.00 per Structure \$ _____
- B. \$ 2.00 per 100 Sq. Ft. \$ _____

PLAN REVIEW & TOTAL FEES

- A. \$80.00 Plan Review \$ _____
- B. Total Cost Of Permit \$ _____

Is Building To Be Heated?

Yes: ☒ No: _____

If Manufacturing And Or Storage Facility,
 What Type Products Or Materials Are
 Stored Or Processed?

Electrical Contractor: _____
Address: _____
City: _____ State: _____
Zip Code: _____ Telephone: _____
License Number: _____

Existing Use Group: A-1 A-2 A-3 A-4 A-5 B E F-1 F-2 H I-1
(C 301.1) I-2 I-3 M U R-1 R-2 R-3 R-4 R-5 S-1 S-2

Proposed Use Group: A-1 A-2 A-3 A-4 A-5 B E F-1 F-2 H I-1
(C 301.1) I-2 I-3 M U R-1 R-2 R-3 R-4 R-5 S-1 S-2

(C 401)
Existing Construction Classification: 1A 1B 2A 2B 2C 3A 3B 4 5A 5B N/A
(C 401)
Proposed Construction Classification: 1A 1B 2A 2B 2C 3A 3B 4 5A 5B N/A

Proposed Use And Occupancy: (OBBC 313.0) Option #1 Option #2 Option #3 N/A

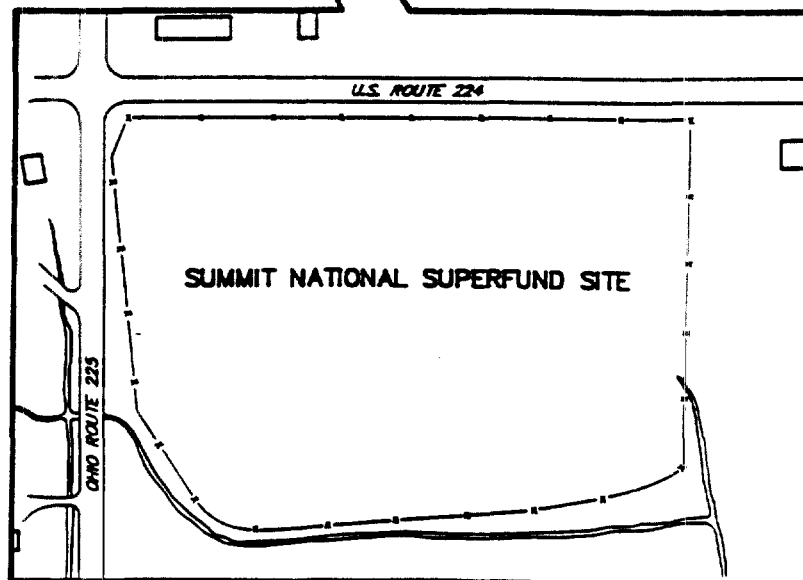
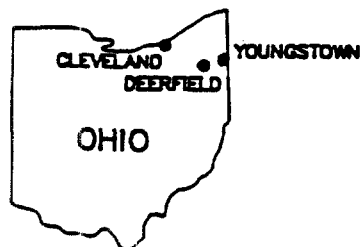
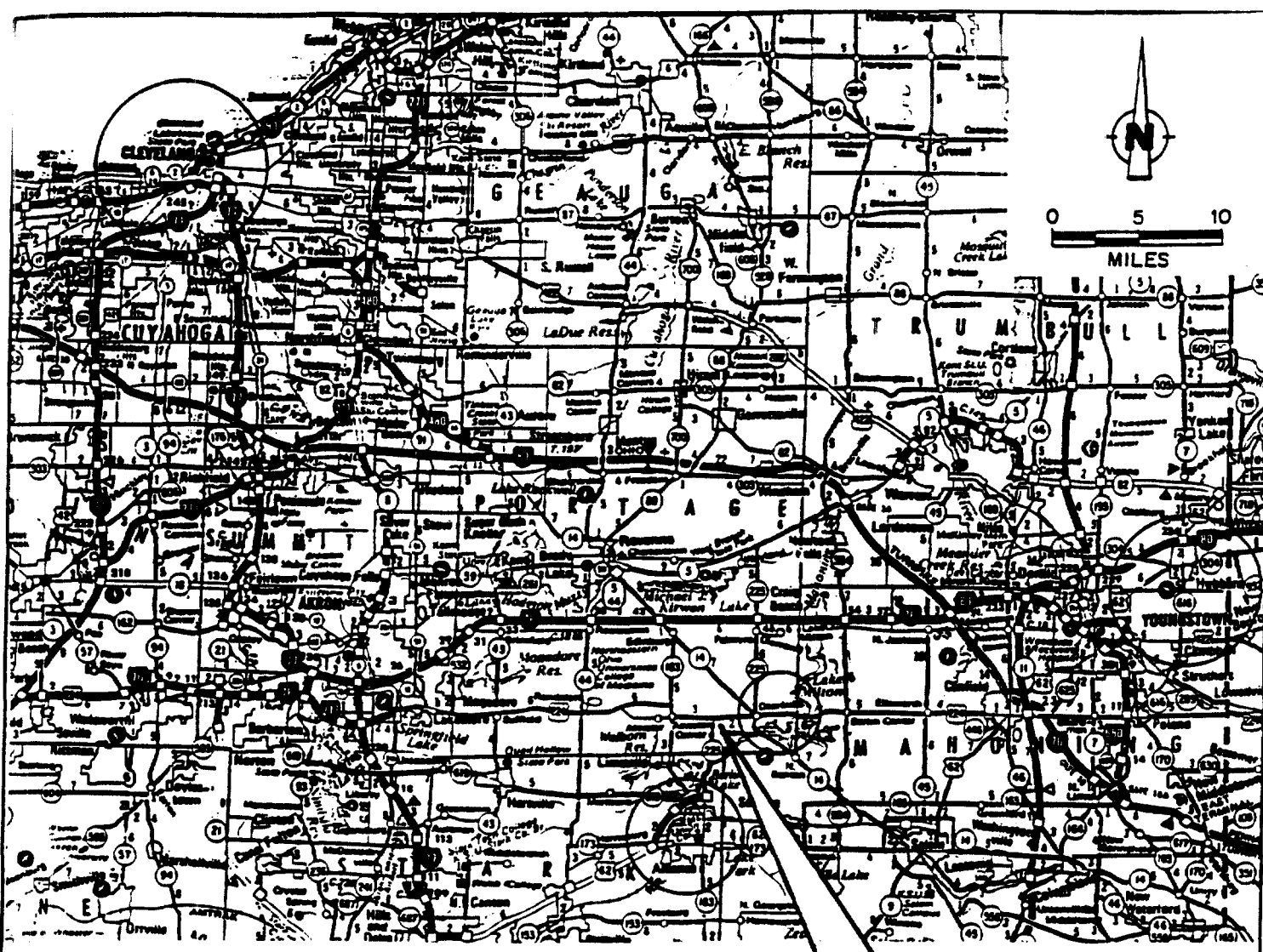
Existing Building Area _____ SF/Height: _____ Ft./No. of Stories: _____ (OBBC 501)
Proposed Building Area 4600 SF/Height: 35 Ft./No. of Stories: 1 (OBBC 501)
Number of Exits: Existing: _____ New: 8 Total: 8 (OBBC 807)
Maximum Existing Exit Access Travel Length: 230 Ft: _____ N/A (OBBC 807)
Area Limitations: *General (OBBC 502, 503) *Unlimited (OBBC 504)
Existing Building Fire Suppression System *Total *Partial *None *N/A (OBBC 1002)
New Building Fire Suppression System *Total *Partial *None *N/A (OBBC 1002)
Elevation Of First Level Of Habitable Space: _____ Ft Above Average Grade (OBBC 1002)
Number Of Off Street Parking Spaces: Existing: _____ New: _____ Total: _____ (OBBC 1002)
Square Footage Of Parking Lot: Existing: _____ New: _____ Total: _____ (OBBC 1002)
Is Building Handicap Accessible? Yes: _____ No: _____

I Fully Understand That All Information On This Form Is Necessary For Proper
Examination Of My Plans And Further That Failure To Provide The Above Data Is
Sufficient Cause For My Plans To Be Rejected By Plan Approval.

SIGNATURE

TITLE

DATE



SOURCE: OHIO OFFICIAL TRANSPORTATION MAP, 1987

figure A

SITE LOCATION
SUMMIT NATIONAL SUPERFUND SITE
Deerfield Township of Portage County, Ohio

CRA

SECTION 4

APPLICATION FORM

HEATING, VENTILATION AND AIR CONDITIONING PERMIT

COUNTY OF PORTAGE

DIVISION OF BUILDING INSPECTION

November __, 1992

Reference No. 2372-10

DRAFT

Mr. David Truax
County of Portage
Division of Building Inspection
449 South Meridian Street
Ravenna, Ohio 44266

Dear Mr. Truax:

Re: HVAC Permit Application
Groundwater Treatment Facility
Summit National Superfund Site
Deerfield Township of Portage County, Ohio

On behalf of the Summit National Facility Trust, attached is the completed application for a Heating, Ventilation and Air Conditioning (HVAC) Permit for the groundwater treatment facility to be installed at the above Site as part of the Remedial Action activities to be implemented at the Site. The HVAC Permit Application is being submitted to ascertain that all applicable or relevant and appropriate requirements will be satisfied as required by the Consent Decree. Details pertaining to the design and installation of the groundwater treatment facility are presented in the Final Design Report and the Remedial Construction Work Plan, respectively, for the above Site.

Should you have any questions or require additional information, please do not hesitate to contact the undersigned or the following remedial project managers:

Mr. Anthony Rutter
Director, Waste Management Division
Remedial Project Manager
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604
Tel: (312) 886-8961

Mr. Regan S. Williams
State Project Coordinator
Ohio EPA - Division of
Emergency & Remedial Response
2110 East Aurora Road
Twinsburg, Ohio 44087
Tel: (216) 425-9171

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Steve Whillier, B. Sc.

SW/ec

Encl.

c.c.: Anthony Rutter, USEPA
Peter Felitti, USEPA
Regan Williams, OEPA
Gary Gifford, SNFT
Jack Michels, CRA
Gerry Kestle, CRA

New Home: _____
Ex. Home: _____
Replacement: _____
Air Cnd. Ex. Home: _____

COUNTY OF PORTAGE
Division of Building Inspection
449 South Meridian Street
Ravenna, Ohio 44266
Phone: 297-3530

PERMIT # _____
CK# _____
RECEIPT # _____

Attn: David Trux

APPLICATION FOR HEATING, VENTILATING, & AIR CONDITIONING PERMIT

OWNER'S NAME: Summit National Facility Trust TOWNSHIP: Deerfield
c/o Gary Gifford, Goodyear Tire & Rubber Co.
ADDRESS: 1144 East Market St., Akron, Ohio 44316 - PHONE: (216) 776-1348
0001

CONTRACTOR'S NAME: _____ Phone: _____

ADDRESS: _____ CITY: _____

\$30.00 BASE FEE FOR
THE FOLLOWING LISTED:

- | | | NUMBER OF
UNITS: | / | TOTAL FEE: |
|----------------------|----------------------------------|---------------------|-------|------------|
| 1. Heating | PLUS \$20.00 for the/each unit: | _____ | _____ | _____ |
| 2. Ventilating: | PLUS \$20.00 for the/each unit : | _____ | _____ | _____ |
| 3. Air Conditioning: | PLUS \$20.00 for the/each unit : | _____ | _____ | _____ |
| 4. Dust Collector: | PLUS \$20.00 for the/each unit : | _____ | _____ | _____ |
| 5. Refrigeration: | PLUS \$20.00 for the/each unit : | _____ | _____ | _____ |

\$40.00 BASE FEE FOR
THE FOLLOWING (1) LISTED:

Combination Heating &
Air Conditioning: PLUS \$25.00 for the/each unit: _____

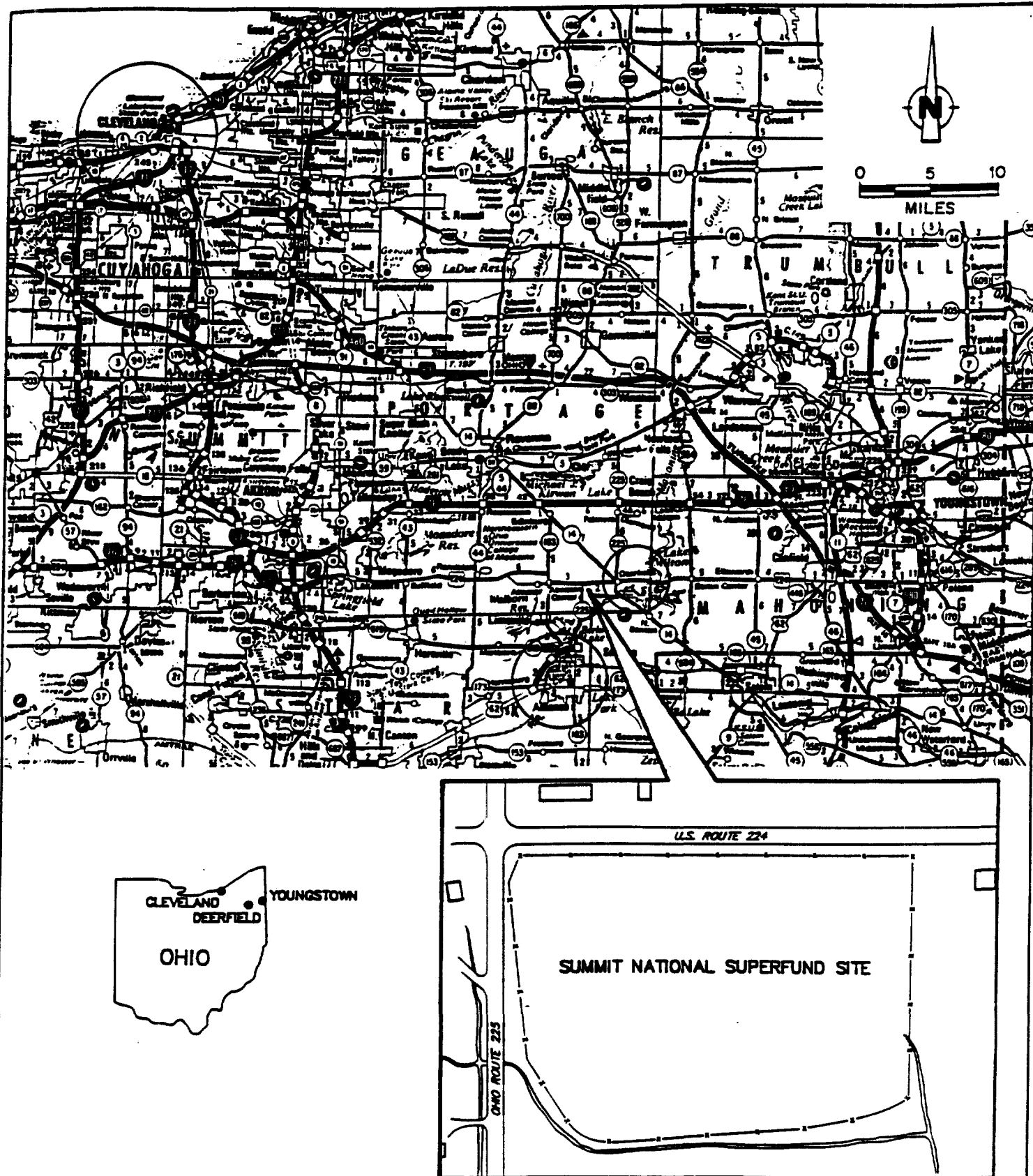
RE-INSPECTION made necessary by faulty or
incomplete work per RE-INSPECTION: \$20.00

ADDITION OR EXTENSION FEE: When no unit
change is made: \$20.00

SIGNED: _____ DATE: _____

TOTAL FEE: _____

"PLEASE" make your check payable to: THE PORTAGE COUNTY TREASURER



SOURCE: OHIO OFFICIAL TRANSPORTATION MAP, 1987

figure A

SITE LOCATION
SUMMIT NATIONAL SUPERFUND SITE
Deerfield Township of Portage County, Ohio

CRA

SECTION 5

APPLICATION FORM

PLUMBING PERMIT

PORTAGE COUNTY HEALTH DEPARTMENT

County of Portage
Department of Health
149 South Meridian Street
Ravenna, Ohio 44266
Telephone #296-9919
Attn: Bob Wilkins

PLUMBING PERMIT APPLICATION
PORTAGE COUNTY COMBINED
GENERAL HEALTH DISTRICT



Date: _____

Summit National Facility Trust
Owner's Name

C/O Mr. Gary Gifford
The Coal Seam Time & Ruben Co.
Present Address

(216) - 776 - 1542
Telephone No.

Summit National Superfund Site
Intersection of Ohio Route 225 and US Route 224
Location (Number and Street)

Heathcote
Township

Portage
Village Center

New: ☒ Remodel: _____ Addition: _____ Type of Building: Groundwater Treatment

Approved By: _____

I HEREBY CERTIFY THAT ALL WORK WILL BE DONE IN ACCORDANCE WITH THE STATE
AND LOCAL REGULATIONS.

A \$20.00 Reinspection Fee Will Be Assessed
If The Plumbing Does Not Meet State
Requirements

Applicant Signature

Applicant's Name: _____

Address: _____

Telephone No. _____

Registration No. _____

Description	Charge Each	Amount	Description	Charge Each	Amount
Water Closet (Toilet)	\$2.00		Water Line	\$ 6.00	
Lavatories	2.00		Building Drain	10.00	
Kitchen Sink	2.00		Stacks	4.00	
Bath Tub	2.00		Urinals	2.00	
Shower	2.00		Drinking Fountain	2.00	
Laundry Trap	2.00		Commercial Sink	2.00	
Washing Machine	2.00		Inside Conductor	5.00	
Wash Fountain	10.00		Garage Interceptor	10.00	
Dish Washer	2.00		Grease Trap	10.00	
Water Heater	5.00		Swimming Pool	10.00	
Garbage Disposal	2.00		Sewer	20.00	
Wash Rack	2.00		Slop Sink	2.00	
Incinerators	5.00		Sand Trap	2.00	
Shampoo Bowl	5.00		Bar Connections	10.00	
Floor Drain	2.00		Soda Fountain	10.00	
Sump Pump	2.00		Dishwasher Comm.	10.00	
Others			Underground Insp.	10.00	

UNDERGROUND Approved _____
Disapproved _____

TOP OUT Approved _____
Disapproved _____

FINAL Approved _____
Disapproved _____

Application For Permit: \$30.00

Total of the Above: _____

Grand Total: _____

Make Checks Payable to the
Portage County Health Department

Solder joints used in water distribution or water
service piping shall not exceed two-tenths of one
per cent lead by weight.

REMARKS: _____

PORTAGE COUNTY COMBINED GENERAL HEALTH DISTRICT

Portage County Administration Building
449 South Meridian Street
Ravenna, Ohio 44266

K. F. RUPP, M.D., F.A.A.F.P.
Health Commissioner

Rec'd CRA

SEP 04 1992



May 13, 1992

Dear Plumber:

Again it is time for registration of plumbers in Portage County. Your current registration will expire on June 30, 1992.

To renew your registration, please remit the following:

1. \$100.00 check payable to the Portage County Health Department.
2. Certificate of Insurance in the amount of \$300,000/\$300,000 Bodily Injury and \$100,000 Property Damage with Portage County Health Department, 449 South Meridian Street, Ravenna, Ohio 44266, as the certificate holder.

The above two (2) documents, check and certificate of insurance, must be received or contents will be returned to you.

Sincerely,

Robert H. Wilkins,
Chief Plumbing Inspector

RHW/cm

SPECIAL NOTICE

NO PLUMBING SYSTEMS WILL BE APPROVED WITHOUT A
WATER OR AIR TEST AT THE TIME OF INSPECTION!!!

PORTAGE COUNTY COMBINED GENERAL HEALTH DISTRICT

Portage County Administration Building
449 South Meridian, 3rd Floor

Ravenna, Ohio 44266

K. F. RUPP, M.D., F.A.A.F.P.
Health Commissioner

PHONE:: Area Code 216-296-9919

PLUMBERS APPLICATION FOR REGISTRATION

1. Firm Name _____ Phone Number _____
2. Address _____
3. Legal form of organization: Individual? _____ Partnership? _____
4. Business established _____
5. President of firm: _____
6. Your experience _____
Number of years apprentice _____ Journeyman _____ Master _____
7. Do you employ one or more mechanics constantly? _____
8. Do you hold a plumber's license? _____ If so, where? _____
9. Have you ever had a warrant served on you as a result of affidavit filed by an inspector of the Portage County Health Department? _____
If so, give details: _____

I further subscribe that, if registered, I will abide by the plumbing provisions set forth in the Ohio Building Code and that I will assist to the best of my ability in its enforcement in such buildings as are designated therein.

I hereby certify that the information contained in the foregoing application is correct to the best of my knowledge.

Name

Sworn and subscribed before me on this _____ Day of _____
19 _____.

Notary

AN EQUAL OPPORTUNITY EMPLOYER

NO PERSON SHALL ON THE GROUNDS OF RACE, COLOR OR NATIONAL ORIGIN BE DENIED SERVICES

Meridian Street
Cincinnati, Ohio 44266
Telephone #296-9919

**PLUMBING PERMIT APPLICATION
PORTAGE COUNTY COMBINED
GENERAL HEALTH DISTRICT**



Date: _____

Owner's Name _____ Present Address _____ Telephone No. _____

Location (Number and Street) _____ Township _____ Village _____

New: _____ Remodel: _____ Addition: _____ Type of Building: _____

Approved By: _____

I HEREBY CERTIFY THAT ALL WORK WILL BE DONE IN ACCORDANCE WITH THE STATE AND LOCAL REGULATIONS.

A \$20.00 Reinspection Fee Will Be Assessed
If The Plumbing Does Not Meet State
Requirements

Applicant Signature _____

Applicant's Name: _____

Address: _____

Telephone No. _____

Registration No. _____

Description	Charge Each	Amount	Description	Charge Each	Amount
Water Closet (Toilet)	\$2.00		Water Line	\$ 6.00	
Lavatories	2.00		Building Drain	10.00	
Kitchen Sink	2.00		Stacks	4.00	
Bath Tub	2.00		Urinals	2.00	
Shower	2.00		Drinking Fountain	2.00	
Laundry Trap	2.00		Commercial Sink	2.00	
Washing Machine	2.00		Inside Conductor	5.00	
Wash Fountain	10.00		Garage Interceptor	10.00	
Dish Washer	2.00		Grease Trap	10.00	
Water Heater	5.00		Swimming Pool	10.00	
Garbage Disposal	2.00		Sewer	20.00	
Wash Rack	2.00		Slop Sink	2.00	
Incinerators	5.00		Sand Trap	2.00	
Shampoo Bowl	5.00		Bar Connections	10.00	
Floor Drain	2.00		Soda Fountain	10.00	
Sump Pump	2.00		Dishwasher Comm.	10.00	
Others			Underground Insp.	10.00	

UNDERGROUND Approved _____
Disapproved _____

TOP OUT Approved _____
Disapproved _____

FINAL Approved _____
Disapproved _____

Application For Permit: \$30.00

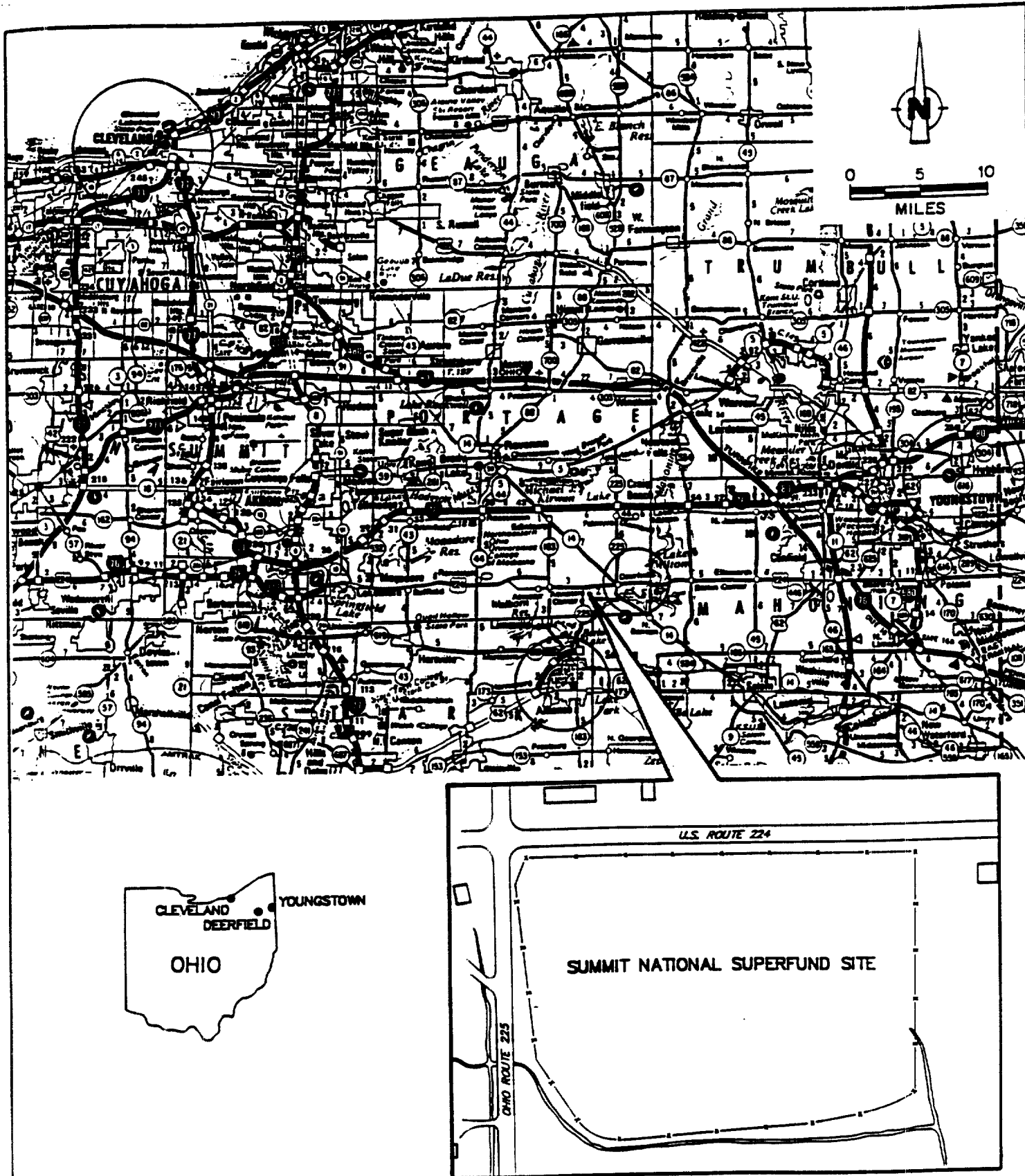
Total of the Above: _____

Grand Total: _____

Make Checks Payable to the
Portage County Health Department

Solder joints used in water distribution or water service piping shall not exceed two-tenths of one per cent lead by weight.

REMARKS: _____



SOURCE: OHIO OFFICIAL TRANSPORTATION MAP, 1987

figure A

SITE LOCATION
SUMMIT NATIONAL SUPERFUND SITE
Deerfield Township of Portage County, Ohio

CRA

SECTION 6

REQUEST FORM

SEPTIC SYSTEM SITE INSPECTION

OHIO ENVIRONMENTAL PROTECTION AGENCY

November __, 1992

Reference No. 2372-10

DRAFT

Mr. Peter Kilmer
Northeast District Office
Ohio EPA
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969

Dear Mr. Kilmer:

Re: Septic Tank Site Inspection Request
Groundwater Treatment Facility
Summit National Superfund Site
Deerfield Township of Portage County, Ohio

On behalf of the Summit National Facility Trust, attached is the completed application for a Septic Tank Site Inspection Request (REQUEST) for the groundwater treatment facility to be installed at the above Site as part of the Remedial Action activities to be implemented at the Site. The REQUEST is being submitted to ascertain that all applicable or relevant and appropriate requirements will be satisfied as required by the Consent Decree. Details pertaining to the design and installation of the groundwater treatment facility are presented in the Final Design Report and the Remedial Construction Work Plan, respectively, for the above Site.

Should you have any questions or require additional information, please do not hesitate to contact the undersigned or the following remedial project managers:

Mr. Anthony Rutter
Director, Waste Management Division
Remedial Project Manager
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604
Tel: (312) 886-8961

Mr. Regan S. Williams
State Project Coordinator
Ohio EPA - Division of
Emergency & Remedial Response
2110 East Aurora Road
Twinsburg, Ohio 44087
Tel: (216) 425-9171

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Steve Whillier, B. Sc.

SW/ec
Encl.

c.c.: Anthony Rutter, USEPA
Peter Felitti, USEPA
Regan Williams, OEPA
Gary Gifford, SNFT
Jack Michels, CRA
Gerry Kestle, CRA

OHIO EPA
Attn: Pete Kline
tel: (216) -463-1135

NOTICE

To those persons considering development
in areas not served by public sewerage
systems.

1/15/89
Rec'd CRA

SEP 09 1992

In accordance with Section 6111.44 and 6111.45 of the Ohio Revised Code, plan approval from the Ohio EPA must be obtained for sewage treatment systems serving all building and activities other than those serving a one, two or three family residence. This requirement applies to both sanitary and industrial waste and includes all liquid, semiliquid and sludge wastes that would be produced and treated or discharged on the site.

Wastes that are controlled by State and Federal Hazardous Waste Regulations would not be included under Chapter 6111 unless the sewage or industrial waste system were included in the treatment system for these wastes or their residuals. Normally, hazardous wastes are and should be totally segregated from the sanitary and liquid industrial waste stream.

Examples of new developments that fall under 6111 jurisdiction include:

Office	Motels	Food Service Carry Out	Subdivisions
Warehouses	Taverns	Camps	Mobile Home Parks
Factories	Restaurants	Retail Stores	Apartments (4 or more units)

Projects planning to utilize existing structures which would involve a change in the prior use or an expansion are required to have plan approval.

The following procedures are outlined to assist individuals planning new development. Sufficient time must be allowed for State on-site evaluation and sewage treatment system detail plan approval.

As not all sites are suitable for a proposed use, to avoid financial hardship, it is important to secure a preliminary site approval prior to completing the purchase of any parcel for development or expending money to erect new structures or expand any existing structures.

Procedures

The approval process includes the initial site review followed by a letter summarizing Ohio EPA recommendations with regard to that review, the submittal of approvable detail plans, and the final letter of approval from the Director of the Ohio EPA.

Site Inspection Request

To initiate the approval process, a written request for a site inspection must be submitted to the Ohio EPA outlining the specific details relating to the type of business proposed (retail store, bakery, machine shop, etc.), the anticipated water usage, the description of all types of liquid, semiliquid, and sludge wastes that will be generated, and of any existing sewage treatment facilities. The attached "Site Evaluation Request Form" may be used. A site address should be obtained prior to requesting the inspection.

Ohio EPA
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171

Site reviews can usually be accomplished within a 45 day period following Ohio EPA receipt of a written site review request.

Site Inspection Recommendation Letter

Within one to two weeks following the site inspection and the submittal of requested supplemental information (such as soils reports and future sewerage plans for the area) you should expect to receive a letter indicating Ohio EPA opinion of the project and their recommendations as to the type and size of the sewage treatment system.

Preparation of Detail Plans

Prior to construction, detail plan approval of the sewage treatment system must be obtained.

The Ohio EPA recommends that you obtain the services of a local engineer experienced in the preparation of detail plans for the size of sewage system being considered. If the project is relatively large or complex, we would encourage the designer to prepare a general plan or outline first, discuss this design with us and then proceed with the detail plans accordingly. Involvement of the installer or equipment manufacturer in the planning process is recommended.

Plan Approval

If the plans are properly prepared and in general conformance with accepted sanitary engineering practice, then review in the District Office should be accomplished within four weeks and the submittal sent to the Director for final action. Assuming that there are no local objections to the project, final approval can be expected about four to six weeks following the date plans were sent out of the District Office. Construction of the wastewater treatment system cannot start until that final approval is received from the Director.

Summation

As noted above, and assuming a 30 day period to prepare the plans, the approval process can take up to four months to accomplish. This time period should not present any problems if the process is started early.

Please complete this form and return to the OEPA or the Health Department.
This form must be completed and returned prior to a site inspection being made.

PLEASE PRINT OR TYPE

County Portage
Township/City/Village Deerfield
Project/Business Name Summit National Superfund Site
Site Address Intersection of Ohio Route 225 & US Route 224
Type of operation or development proposed: Groundwater Treatment System

Name and mailing address of new or proposed owner:

Telephone: 216-746-1345

Summit National Facility Trust c/o
Gary Gifford, The Goodyear Tire & Rubber Co.
1144 East Market Street, Akron, Ohio 44325-0001

Print or type name: Gary Gifford,
Chairman, SNFT

Signature: _____

Date: _____

LOCATION MAP: Please provide a location map clearly describing the location of the site (i.e. north side of Smith Road, 1000 feet east of the intersection of John St.).
See Figure A.

PLEASE NOTE: The inspector may not be familiar with the area, so be specific in describing the location.

SKETCH OF PROPERTY: Please provide a sketch of the site indicating the location of the following:

1. North directional arrow
2. Footage of all property lines
3. Existing and proposed buildings
4. Location of any existing sewage systems and water wells
5. Streams or ponds on the property
6. Size of Property: 11 acres or _____ X _____ frontage

Provide a detailed description of the components of any ~~existing~~ ^{new} sewage treatment system on the property.
to be installed

Sanitary holding tank to be pumped out on a
regular basis. See Remedial Construction Work Plan for detail.

Type of water supply proposed: (circle one)

Well - private

Municipal system

- Provide a complete description of the proposed project and wastewater to be generated including floor drains if applicable:

- Groundwater treatment system including aeration
treatment, biological treatment, filtration, and
liquid phase carbon adsorption. Treated effluent
to be discharged to northeast drainage ditch
off-site.

FILL OUT SECTION APPLICABLE

- Subdivision/Mobile Home Park

- # of homes _____
of trailers _____

Factories, Offices, Service Facilities,
Warehouses, Retail Outlets

Will industrial wastes be produced? No
Square footage of complex or addition 4600
of employees 2
Are showers provided Yes
Will food be prepared in this building? No
Will floor drains be installed? No

- Apartments

of one-bedroom units _____
of two-bedroom units _____
of three-bedroom units _____

Grocery Store/Carry-out convenience food stores

of employees _____
Will food be prepared in the store? _____
Will you sell prepackaged items only? _____

- Restaurant

of seats _____
Is it carry-out only? _____

Church

of sanctuary seats _____
How many services held per week? _____
Will there be a kitchen in the church? _____
Will food be prepared and served to
the public? _____
Will there be a day care center? _____

- Camp

of sites _____
of showers _____
of flush toilets _____
Will there be a dump station? _____

- SOIL INFORMATION: (for on-site dissipation consideration)

Soil Type(s) Silty Clay, Sand, Gravel, Coal Fragments

Permeability Rate _____

- Depth to seasonal water table ~ 10 ft

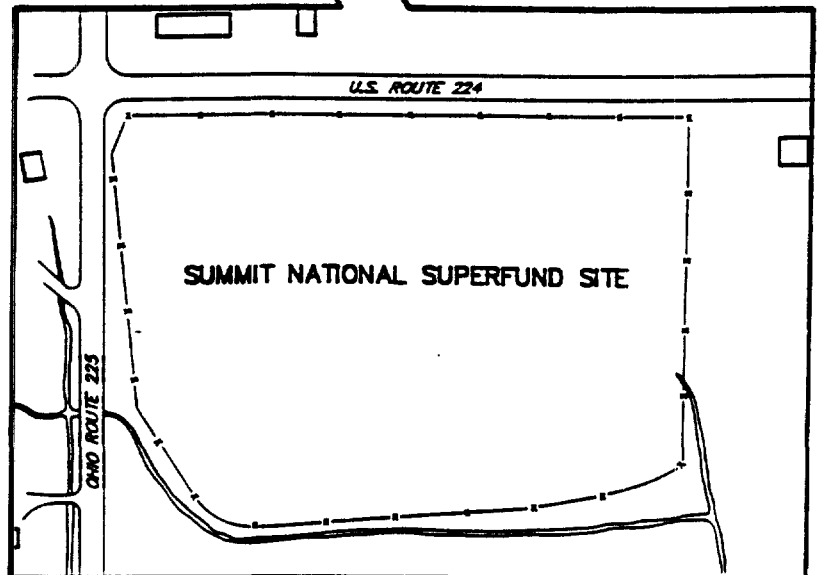
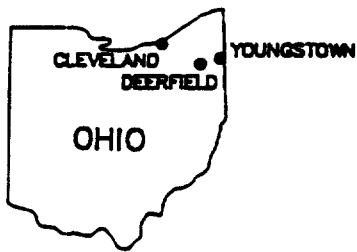
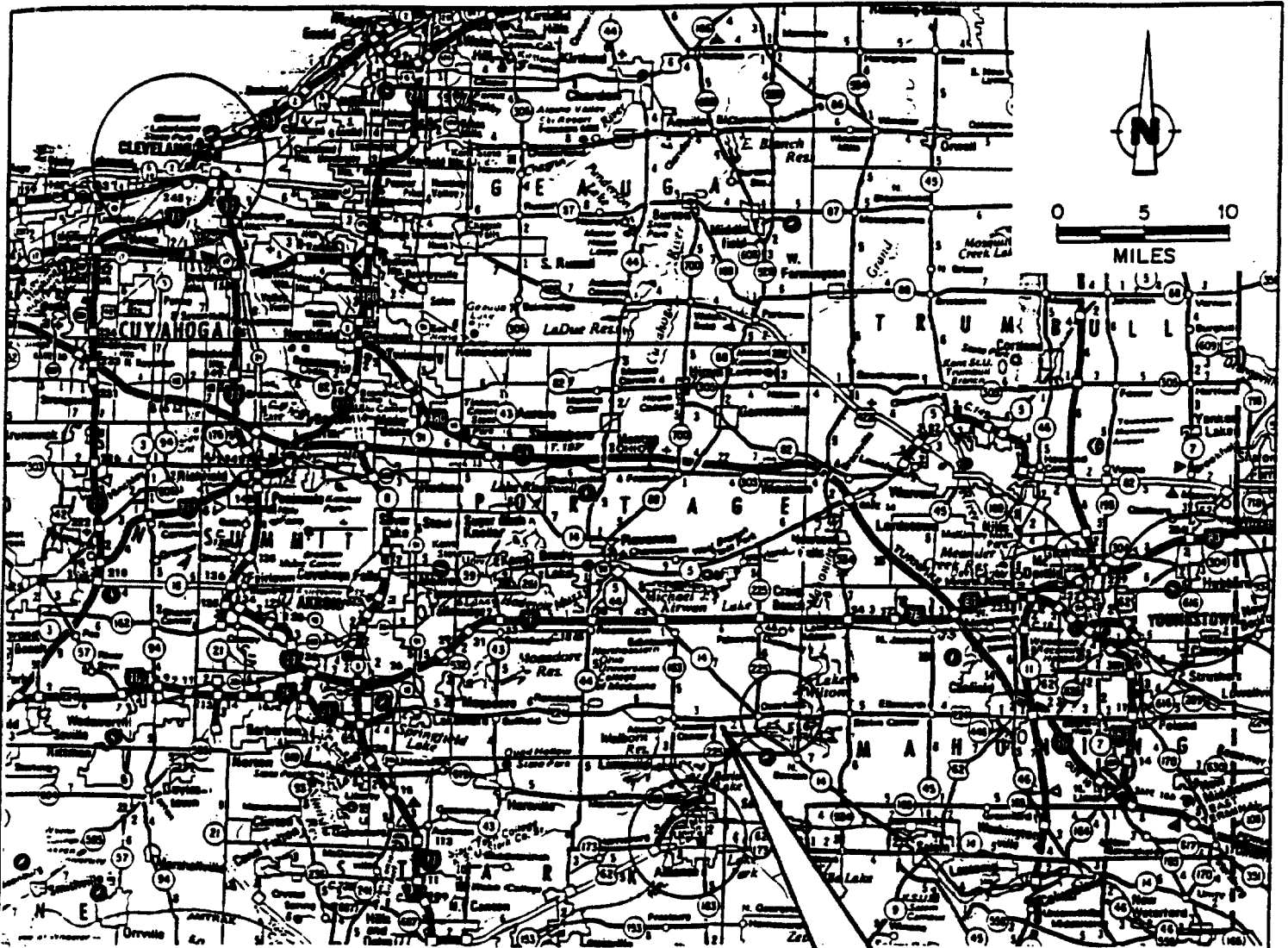
Depth to bedrock ~ 15 to 30 ft.

CATION MAP

See Figure A

SKETCH OF PROPERTY

See Figure A



SOURCE: OHIO OFFICIAL TRANSPORTATION MAP, 1987

figure A

SITE LOCATION
SUMMIT NATIONAL SUPERFUND SITE
Deerfield Township of Portage County, Ohio

CRA

Rec'd CRA
SEP 08 1992

NOTICE

To those persons considering development
in areas not served by public sewage systems.

In accordance with Section 6111.44 and 6111.45 of the Ohio Revised Code, plan approval from the Ohio EPA must be obtained for sewage treatment systems serving all buildings and activities other than those serving a one, two or three family residence. This requirement applies to both sanitary and industrial wastes and includes all liquid, semiliquid and sludge wastes that would be produced and treated or discharged on the site.

Wastes that are controlled by State and Federal Hazardous Waste Regulations would not be included under Chapter 6111 unless the sewage or industrial waste systems were included in the treatment system for these wastes or their residuals. Normally, hazardous wastes are and should be totally segregated from the sanitary and liquid industrial waste stream.

Examples of new developments that fall under 6111 jurisdiction include:

Office	Motels	Food Service Carry Out	Subdivisions
Warehouses	Taverns	Camps	Mobile Home Parks
Factories	Restaurants	Retail Stores	Apartments (4 or more units)

Projects planning to utilize existing structures which would involve a change in the prior use or an expansion are required to have plan approval.

The following procedures are outlined to assist individuals planning new development. Sufficient time must be allowed for State on-site evaluation and sewage treatment system detail plan approval.

As not all sites are suitable for a proposed use, to avoid financial hardship, it is important to secure a preliminary site approval prior to completing the purchase of any parcel for development or expending money to erect new structures or expand any existing structures.

Procedures

The approval process includes the initial site review followed by a letter summarizing Ohio EPA recommendations with regard to that review, the submittal of approvable detail plans, and the final letter of approval from the Director of the Ohio EPA.

Site Inspection Request

To initiate the approval process, a written request for a site inspection must be submitted to the Ohio EPA outlining the specific details relating to the type of business proposed (retail store, bakery, machine shop, etc.), the anticipated water usage, the description of all types of liquid, semi-liquid, and sludge wastes that will be generated, and of any existing sewage treatment facilities. The attached "Site Evaluation Request Form" may be used. A site address should be obtained prior to requesting the inspection.

Provide a complete description of the proposed project and wastewater to be generated including floor drains if applicable:

Groundwater treatment system including aeration
treatment, biological treatment, filtration, and
liquid phase carbon adsorption. Treated effluent
to be discharged to northeast drainage ditch
off-site.

FILL OUT SECTION APPLICABLE

☐ Subdivision/Mobile Home Park

☐ # of homes _____
☐ # of trailers _____

☐ Apartments

☐ # of one-bedroom units _____
☐ # of two-bedroom units _____
☐ # of three-bedroom units _____

☐ Restaurant

☐ # of seats _____
☐ Is it carry-out only _____

☐ Camp

☐ # of sites _____
☐ # of showers _____
☐ # of flush toilets _____
☐ Will there be a dump station? _____

Factories, Offices, Service Facilities,
Warehouses, Retail Outlets

Will industrial wastes be produced? Yes
Square footage of complex or addition ~4600
of employees 2
Are showers provided Yes
Will food be prepared in this building? No
Will floor drains be installed? Yes to all

Grocery Store/Carry-out convenience food stores

of employees _____
Will food be prepared in the store? _____
Will you sell prepackaged items only? _____

Church

of sanctuary seats _____
How many services held per week? _____
Will there be a kitchen in the church? _____
Will food be prepared and served to
the public? _____
Will there be a day care center? _____

☐ SOIL INFORMATION: (for on-site dissipation consideration)

Soil Type(s) Silty Clay, Sand, Gravel, Coal Fragments
Permeability Rate _____
Depth to seasonal water table ~10 ft
Depth to bedrock ~15 to 30 ft.

CATION MAP

See Figure A

SKETCH OF PROPERTY

See Figure A

Ohio EPA
Northeast District Office
2110 E. Aurora Road
Twinsburg, Ohio 44087-1969
(216) 425-9171

Site reviews can usually be accomplished within a 45 day period following Ohio EPA receipt of a written site review request.

Site Inspection Recommendation Letter

Within one to two weeks following the site inspection and the submittal of requested supplemental information (such as soils reports and future sewerage plans for the area) you should expect to receive a letter indicating Ohio EPA opinion of the project and their recommendations as to the type and size of the sewage treatment system.

Preparation of Detail Plans

Prior to construction, detail plan approval of the sewage treatment system must be obtained.

The Ohio EPA recommends that you obtain the services of a local engineer experienced in the preparation of detail plans for the size of sewage system being considered. If the project is relatively large or complex, we would encourage the designer to prepare a general plan or outline first, discuss this design with us and then proceed with the detail plans accordingly. Involvement of the installer or equipment manufacturer in the planning process is recommended.

Plan Approval

If the plans are properly prepared and in general conformance with accepted sanitary engineering practice, then review in the District Office should be accomplished within four weeks and the submittal sent to the Director for final action. Assuming that there are no local objections to the project, final approval can be expected about four to six weeks following the date plans were sent out of the District Office. Construction of the wastewater treatment system cannot start until that final approval is received from the Director.

Summation

As noted above, and assuming a 30 day period to prepare plans, the approval process can take up to four months to accomplish. This time period should not present any problems if the process is started early.

SECTION 7

**APPLICATION FORM
ZONING CERTIFICATE**

DEERFIELD TOWNSHIP

November __, 1992

Reference No. 2372-10

DRAFT

Mr. Jesse Carver
Deerfield Township Zoning Inspector
Portage County
Deerfield, Ohio 44411

Dear Mr. Carver:

Re: Application for Zoning Certificate
Groundwater Treatment Facility
Summit National Superfund Site
Deerfield Township of Portage County, Ohio

On behalf of the Summit National Facility Trust, attached is the completed application for a Zoning Certificate for the groundwater treatment facility to be installed at the above Site as part of the Remedial Action activities to be implemented at the Site. The application is being submitted to ascertain that all applicable or relevant and appropriate requirements will be satisfied as required by the Consent Decree. Details pertaining to the design and installation of the groundwater treatment facility are presented in the Final Design Report and the Remedial Construction Work Plan, respectively, for the above Site.

Should you have any questions or require additional information, please do not hesitate to contact the undersigned or the following remedial project managers:

Mr. Anthony Rutter
Director, Waste Management Division
Remedial Project Manager
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604
Tel: (312) 886-8961

Mr. Regan S. Williams
State Project Coordinator
Ohio EPA - Division of
Emergency & Remedial Response
2110 East Aurora Road
Twinsburg, Ohio 44087
Tel: (216) 425-9171

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Steve Whillier, B. Sc.

SW/ec

Encl.

c.c.: Anthony Rutter, USEPA
Peter Felitti, USEPA
Regan Williams, OEPA
Gary Gifford, SNFT
Jack Michels, CRA
Gerry Kestle, CRA

DEERFIELD TWP.
Application for Zoning Certificate

Rev. 5/19/16 R.C.

Zoning Inspector
Portage County
Deerfield, Ohio, 44411
(216) 375-2480
Attn: Jesse Carver

--Deerfield-- Township Portage County Application No. _____

To the Board of Township Trustees:

The undersigned hereby applies for a Zoning Certificate for the following use, to be issued on the basis of the representations contained herein, all of which applicant says are true:

1. Location of property See Figure A.
2. Name of Land Owner Summit National Facilities Trust (SNFT)
C/O Gary Gifford, The Goodyear Tire & Rubber Co.
Address 1144 East Market St., Akron, Ohio, 44316-0001
3. Occupant NA
4. Proposed use: ☒ New Construction ☐ Remodeling ☐ Accessory Building
☐ Residence ☐ No. of Families ☐ Business ☐ Manufacturing
☐ Sign Board—Size _____ Other (explain below, use additional sheet if necessary)

5. Sketch of lot, showing existing buildings and proposed construction or use for which application is made. (Fill in all dimensions and indicate North) Per attached plot sheet.

- See Attached Plan
- | | |
|--|--|
| a) Main road frontage <u>~1700</u> feet | e) Depth of lot from right of way |
| b) Set back from side of road right of way <u>~10</u> feet | <u>100</u> feet |
| c) Side yard clearance: | f) Dimensions of building: |
| _____ side _____ feet | Width <u>~80</u> feet |
| _____ side _____ feet | Depth <u>~70</u> feet |
| d) Rear yard clearance _____ feet | g) Highest point of building above the established grade <u>~30</u> feet |

6. Buildings: Use Groundwater Treatment Building
- Number of stories 1 Basement NO
- Usable floor space designed for use as living quarters, exclusive of basements, porches, garages, breezeways, terraces, attics, or partial stories.
- First floor ~4600 square feet Second floor _____ square feet
- Off street parking _____ square feet.

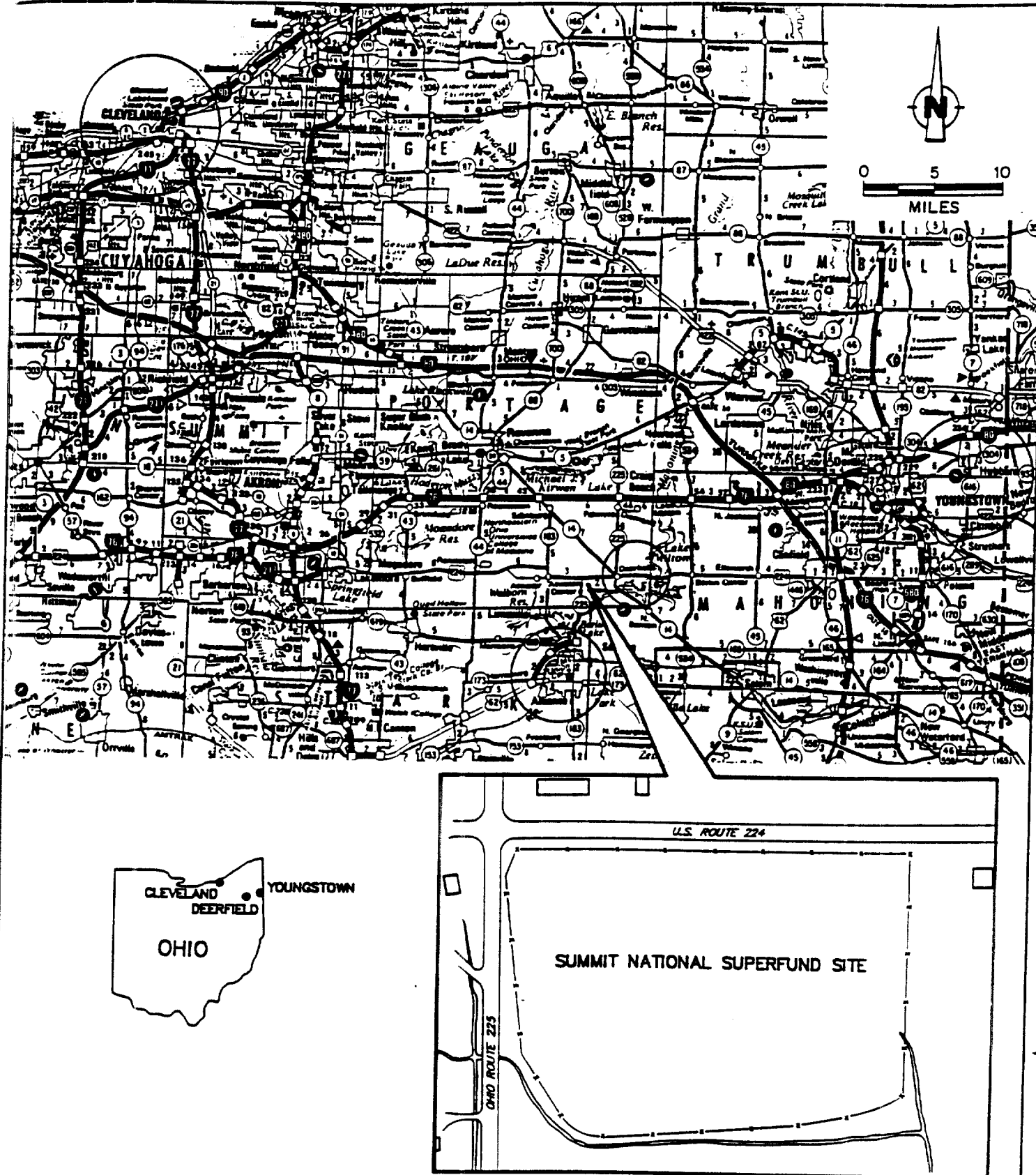
7. Remarks: _____

WITNESS: _____

NOTE: This form to be filed in triplicate.

Applicant

Do not write below this line



SOURCE: OHIO OFFICIAL TRANSPORTATION MAP, 1987

figure A

SITE LOCATION
SUMMIT NATIONAL SUPERFUND SITE
Deerfield Township of Portage County, Ohio

CRA

DEERFIELD TOWNSHIP

Zoning Plot Plan

REQUIREMENTS

- | | |
|-------------------------------------|------------------------|
| 1. Building Location | 4. Lot Size |
| 2. Building Size | 5. Setback Line |
| 3. Side Yard Clearance (both sides) | 6. Street Address |
| | 7. Rear Yard Clearance |

- N -

(See Attached Plan)
E-2

W-

- S -

Signature of Applicant _____

Approved By _____

Zoning Inspector

RETURN TO ZONING INSPECTOR

SECTION 8

APPLICATION FORM

POTABLE WATER SUPPLY WELL INSTALLATION PERMIT

PORTAGE COUNTY HEALTH DEPARTMENT

November __, 1992

Reference No. 2372-10

DRAFT

Mr. Duane Porter
Portage County Department of Health
449 South Meridian Street
Ravenna, Ohio 44266

Dear Mr. Porter:

Re: Potable Water Supply Well Installation Permit
Groundwater Treatment Facility
Summit National Superfund Site
Deerfield Township of Portage County, Ohio

On behalf of the Summit National Facility Trust, attached is the completed application for a Potable Water Supply Well Installation Permit for a potable water supply well to be installed adjacent to the groundwater treatment facility to be installed at the above Site as part of the Remedial Action activities to be implemented at the Site. The application is being submitted to ascertain that all applicable or relevant and appropriate requirements will be satisfied as required by the Consent Decree. Details pertaining to the design and installation of the groundwater treatment facility are presented in the Final Design Report and the Remedial Construction Work Plan, respectively, for the above Site.

Should you have any questions or require additional information, please do not hesitate to contact the undersigned or the following remedial project managers:

Mr. Anthony Rutter
Director, Waste Management Division
Remedial Project Manager
U.S. Environmental Protection Agency
77 West Jackson Boulevard
Chicago, Illinois 60604
Tel: (312) 886-8961

Mr. Regan S. Williams
State Project Coordinator
Ohio EPA - Division of
Emergency & Remedial Response
2110 East Aurora Road
Twinsburg, Ohio 44087
Tel: (216) 425-9171

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Steve Whillier, B. Sc.

SW/ec

Encl.

c.c.: Anthony Rutter, USEPA
Peter Felitti, USEPA
Regan Williams, OEPA
Gary Gifford, SNFT
Jack Michels, CRA
Gerry Kestle, CRA

APPLICATION / PERMIT FOR PRIVATE WATER SYSTEM

Permit #

Health District

Portage County Department of Health

Fee

\$165.00

CHECK ONE ITEM IN EACH BOX:

<input checked="" type="checkbox"/> New Installation	Water System Will Serve:	<input checked="" type="checkbox"/> Well	<input type="checkbox"/> Spring
<input type="checkbox"/> Alteration	<input type="checkbox"/> Single-family dwelling	<input type="checkbox"/> Test Hole	<input type="checkbox"/> Pond
	<input checked="" type="checkbox"/> Other	<input type="checkbox"/> Cistern	<input type="checkbox"/> Hauled Water Storage Tank

(Please type or print in ballpoint pen)

Owner Summit National Facility Trust		Phone No. (216) 796-1348	
Mailing Address c/o Gary Gifford, Goodyear Tire & Rubber Co., 1144 East Market St.,		City Akron	Zip 44316-0001
Location of Property See Figure A - Summit National Superfund Site			
Street Address corner of Ohio Route 225 & US Route 224		Township Deerfield	
Name of Applicant Jack Michels		Phone No. (519) 725-3513	
Address Crestway - Rosen & Associates, 10900 East Higgins Rd., Suite 105, Rosemont, IL 60018			

NOTICE TO APPLICANT: It may be your advantage to read the rules governing Private Water Systems, Chapter 3701-28 of the Administrative Code. This application will not be processed until the site plan is complete and this form bears the signature of the applicant and is accompanied by the appropriate fee.

I/we, the undersigned, hereby agree to install, construct, develop or alter the private water system named in this permit application in accordance with the attached site plan and all other applicable rules.

I/we also understand that the issuance of this permit is conditioned upon the right of the department to enter upon the premises of the private system named in this permit at any reasonable time prior to, during, or after completion of the work specified in this permit for the purpose of determining compliance with Chapter 3701-28 of the Administrative Code.

Applicant's Signature	Date
-----------------------	------

<p>Site Plan</p> <p>See Attached Plan</p>	<p>Indicate distances between water source and the following existing or proposed items:</p> <table border="0"> <tr> <td>_____ Public roadway</td> <td>_____ Buildings</td> </tr> <tr> <td>_____ Driveway</td> <td>_____ House</td> </tr> <tr> <td>_____ Property lines</td> <td>_____ Barn</td> </tr> <tr> <td>_____ Easements</td> <td>_____ Outbuilding</td> </tr> <tr> <td>_____ Sewer lines</td> <td></td> </tr> <tr> <td>_____ Sewage disposal system</td> <td></td> </tr> <tr> <td>_____ Other possible sources of contamination (i.e. buried fuel tank, manure pile, ditches etc.)</td> <td></td> </tr> </table>	_____ Public roadway	_____ Buildings	_____ Driveway	_____ House	_____ Property lines	_____ Barn	_____ Easements	_____ Outbuilding	_____ Sewer lines		_____ Sewage disposal system		_____ Other possible sources of contamination (i.e. buried fuel tank, manure pile, ditches etc.)	
_____ Public roadway	_____ Buildings														
_____ Driveway	_____ House														
_____ Property lines	_____ Barn														
_____ Easements	_____ Outbuilding														
_____ Sewer lines															
_____ Sewage disposal system															
_____ Other possible sources of contamination (i.e. buried fuel tank, manure pile, ditches etc.)															

Note: If the private water system will serve other than a single-family dwelling, detailed plans must also be submitted in compliance with rule 3701-28-03 of the Administrative Code.

DO NOT WRITE BELOW THIS LINE

Permit Approved by	Date
--------------------	------

Note: Not valid without official audit number.

White, Property Owner-Pink, Water System Contractor-Canary, Health Dept.

SECTION 9

**APPLICATION FORM
STORMWATER CONTROL PERMIT**

FORM 1 GENERAL	U.S. ENVIRONMENTAL PROTECTION AGENCY GENERAL INFORMATION <i>Consolidated Permits Program</i> <i>(Read the "General Instructions" before starting.)</i>	I. EPA I.D. NUMBER <div style="border: 1px solid black; height: 20px; width: 100%;"></div>
LABEL ITEMS <div style="border: 1px solid black; padding: 5px;"> I. EPA I.D. NUMBER III. FACILITY NAME V. FACILITY MAILING ADDRESS VI. FACILITY LOCATION </div>		GENERAL INSTRUCTIONS <p>If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent (the area to the left of the label space lists the information that should appear), please provide it in the proper fill-in area(s) below. If the label is complete and correct, you need not complete items I., III., V., and VI (except VI-B which must be completed regardless). Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.</p>
<div style="border: 1px solid black; padding: 10px;"> PLEASE PLACE LABEL IN THIS SPACE </div>		

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms.

SPECIFIC QUESTIONS	MARK "X"			SPECIFIC QUESTIONS	MARK "X"		
	YES	NO	FORM ATTACHED		YES	NO	FORM ATTACHED
A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A)				B. Does or will this facility (either existing or proposed) include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B)			
C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C)				D. Is this a proposed facility (other than those described in A or B above) which will result in a discharge to waters of the U.S.? (FORM 2D)			
E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3)				F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)			
G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)				H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)			
I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)				J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5)			

III. NAME OF FACILITY

1 **SKIP** CHERRY HILL NATIONAL SUPERFUND SITE

IV. FACILITY CONTACT

A. NAME & TITLE (last, first, & title)	B. PHONE (area code & no.)
2 <u>CHERRY HILL</u> <u>CHERRY HILL</u> <u>CHERRY HILL</u>	<u>210</u> <u>716</u> <u>1111</u>

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX	B. CITY OR TOWN	C. STATE	D. ZIP CODE
3 <u>1144 EAST MARKET ST</u>	<u>CHERRY HILL</u>	<u>DE</u>	<u>19001</u>

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER	B. COUNTY NAME		
5 <u>CHERRY HILL</u>	<u>DELRWARE</u>		
C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE (if known)
6 <u>CHERRY HILL</u>	<u>DE</u>	<u>19001</u>	

(No Mailing Address)

VIII. OPERATOR INFORMATION

X. EXISTING ENVIRONMENTAL PERMITS

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

COMMENTS FOR OFFICIAL USE ONLY

EPA Form 3510-1 (8-90)

Please print or type in the unshaded areas only

[illegible]

Continued from the front

IV. Narrative Description of Pollutant Sources					
A. For each outfall, provide an estimate of the area (include units) of impervious surfaces (including paved areas and building roofs) drained to the outfall, and an estimate of the total surface area drained by the outfall.					
Outfall Number	Area of Impervious Surface (provide units)	Total Area Drained (provide units)	Outfall Number	Area of Impervious Surface (provide units)	Total Area Drained (provide units)
001	1.1 Acres	1.1 Acres			
<p>B. Provide a narrative description of significant materials that are currently or in the past three years have been treated, stored or disposed in a manner to allow exposure to storm water; method of treatment, storage, or disposal; past and present materials management practices employed, in the last three years, to minimize contact by these materials with storm water runoff; materials loading and access areas, and the location, manner, and frequency in which pesticides, herbicides, soil conditioners, and fertilizers are applied.</p> <p>See Section 6.2 of Final Design Report and the O&M Plan for the Site</p>					
<p>C. For each outfall, provide the location and a description of existing structural and nonstructural control measures to reduce pollutants in storm water runoff, and a description of the treatment the storm water receives, including the schedule and type of maintenance for control and treatment measures and the ultimate disposal of any solid or fluid wastes that may be discharged.</p>					
Outfall Number	Treatment	List Codes from Table 26.1			
001	None				
V. Nonstormwater Discharges					
<p>A. I certify under penalty of law that the outfall(s) covered by this application have been tested or evaluated for the presence of nonstormwater discharges, and that all nonstormwater discharges from these outfall(s) are identified in either an accompanying Form 2C or Form 2E application for the outfall.</p>					
Name and Official Title (type or print)		Signature		Date Signed	
<p>B. Provide a description of the method used, the date of any testing, and the onsite drainage points that were directly observed during a test:</p> <p>Testing of Stormwater Discharges will be conducted as specified in the O&M Plan for the Site</p>					
VI. Significant Leaks or Spills					
<p>Provide existing information regarding the history of significant leaks or spills of toxic or hazardous pollutants at the facility in the last three years, including the approximate date and location of the spill or leak, and the type and amount of material released.</p> <p>See Section 1.0 of the Final Design Report</p>					

Continued from Page 2

VII. Discharge Information

A, B, C, & D: See instructions before proceeding. Complete one set of tables for each outfall. Annotate the outfall number in the space provided.

Tables VII-A, VII-B, and VII-C are included on separate sheets numbered VII-1 and VII-2.

E: Potential discharges not covered by analysis - Is any pollutant listed in Table 2F-2 a substance or a component of a substance which you currently use or manufacture as an intermediate or final product or byproduct?

☒ Yes (list all such pollutants below)☐ No (go to Section D)

See Table 2.1 of the Remedial Construction Activity in
Safety Plan for the site.

VIII. Biological Toxicity Testing Data

Do you have any knowledge or reason to believe that any biological test for acute or chronic toxicity has been made on any of your discharges or on a receiving water in relation to your discharge within the last 3 years?

☐ Yes (list all such pollutants below)☒ No (go to Section D)**IX. Contract Analysis Information**

Were any of the analyses reported in Item V performed by a contract laboratory or consulting firm?

☐ Yes (list the name, address, and telephone number of, and pollutants analyzed by, each such laboratory or firm below)☐ No (go to Section X)

A. Name	B. Address	C. Area Code & Phone No.	D. Pollutants Analyzed

X. Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

A. Name & Official Title (type or print)	B. Area Code and Phone No.
C. Signature	D. Date Signed

Part A - You must provide the results of at least one analysis for every pollutant in this table. Complete one table for each outfall. See instructions for additional details.

Pollutant and CAS Number (if available)	Maximum Values (include units)		Average Values (include units)		Number of Storm Events Sampled	Sources of Pollutants
	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite	Grab Sample Taken During First 30 Minutes	Flow-weighted Composite		
Oil and Grease						
Biological Oxygen Demand (BOD5)						
Chemical Oxygen Demand (COD)						
Total Suspended Solids (TSS)						
Total Kjeldahl Nitrogen						
Nitrate plus Nitrite Nitrogen						
Total Phosphorus						

pH	Minimum	Maximum	Minimum	Maximum
----	---------	---------	---------	---------

Part B - List each pollutant that is limited in an effluent guideline which the facility is subject to or any pollutant listed in the facility's NPDES permit for its process wastewater (if the facility is operating under an existing NPDES permit). Complete one table for each outfall. See the instructions for additional details and requirements.

[illegible]

Continued from the front

Part C. List each pollutant shown in Tables 2F-2, 2F-3, and 2F-4 that you know or have reason to believe is present. See the instructions for additional details and requirements. Complete one table for each outfall.

[illegible]

Part D. Provide data for the storm event(s) which resulted in the maximum values for the flow weighted composite sample

1	2	3	4	5	6	7	8
Date of Storm Event	Duration of Storm (in minutes)	Total rainfall during storm event (in inches)	Number of hours between beginning of storm measured and end of previous measurable rain event	Maximum rise rate during rain event (gallons/minute or specify units)	Total flow from rain event (gallons or specify units)	Season sample was taken	Form of Precipitation (rainfall, snowment)

9. Provide a description of the method of flow measurement or estimate.

--

APPENDIX F

AIR EMISSIONS AND DISPERSION MODELING PROTOCOLS

F.1 AIR EMISSIONS AND DISPERSION MODELING PROTOCOLS

Air emissions and dispersion modeling of volatile organic compounds (VOCs) potentially emitted during soil excavation activities at the Site was conducted as described in the following sections.

F.1.1 AIR EMISSIONS MODELING

Shen's open landfill and covered landfill emission models were used to model potential VOC emissions from uncovered and covered excavated soil, respectively. Shen's models are presented in a paper entitled "Estimating Hazardous Air Emissions from Disposal Sites" (Shen's paper), Pollution Engineering, 1981. Use of Shen's models to estimate VOC emission rates is recommended in the USEPA Air/Superfund National Technical Guidance Study Series (Air/Superfund) Volume III.

F.1.1.1 Open Landfill Model

The open landfill model is used to estimate emission rates of VOCs from uncovered stockpiles and excavation activities.

Shen's open landfill model equation is as follows:

$$Q = 2C_e W \sqrt{\frac{DL_u}{\pi F_v}} M$$

where:

- Q = emission rate (cm^3/sec)
- C_e = ratio of chemical vapor pressure divided by atmospheric pressure
- W = width of open dump (cm)
- L = length of open dump (cm)
- D = diffusion coefficient (cm^2/sec)
- u = wind speed (cm/sec)
- F_v = Ficks correction factor (dimensionless)
- M = weight ratio of compound in soil (g/g)

The vapor pressure for each compound was calculated using a five degree, temperature dependent polynomial equation. It was conservatively assumed that the temperature of the soil would be approximately 20°C.

The diffusion coefficient, D, was calculated using the Gilliland equation which expresses D in terms of absolute temperature, molecular weight, and atomic diffusion volumes as presented in Shen's paper.

A typical wind speed of 4 m/s was assumed to be representative for the Site.

A conservative value of one was selected for Ficks correction factor from the figure provided in Shen's paper.

The weight percent of the compound in the soil, M, was determined based on soil sampling data from Grid 5-4 which exhibited the highest soil contaminant concentrations at the Site.

The emission rate Q was converted to an emission rate in terms of grams per second (g/sec) based on the standard molar volume of a gas and the compound molecular weight.

A baseline emission rate (g/sm²) for each compound was initially calculated assuming values for Ce, D, u, Fv and M discussed above and assuming that one grid square (100 ft x 100 ft) would be excavated during the period under consideration [i.e. W and L were set equal to 100 ft (3,049 cm)]. This emission rate was then divided by total area (929 m²) to arrive at the unit baseline emission rate. The baseline emission rates calculated using Shen's open landfill air emission model are presented on the attached Spreadsheet 1.

Shen's equation assumes that the soil is unagitated. The unagitated soil baseline emission rates were used to evaluate three air emission scenarios as follows:

- i) emissions from an uncovered stockpile in Grid 2-4 (contaminated soil staging area) with unagitated soil;
- ii) emission from an uncovered stockpile in Grid 2-4 with agitated soil; and
- iii) emissions from backhoe/dump truck operations transporting agitated soil in Grid 5-4.

It was assumed that one-third of a grid square (310 m²) would be excavated each day. The stockpile located in Grid 2-4 was assumed to have an area equal to one-third of a grid square, therefore the actual contaminant emission rates (g/s) from the uncovered stockpile with unagitated soil were calculated by multiplying the baseline emission rates by 310 m².

The contaminant emission rates which occur during excavation of stockpiled soil in Grid 2-4 pending transport to the Waste Consolidation Facility would be elevated due to agitation of the soil. Table 27 of Air/Superfund Volume III provides agitation factors for various soil handling activities. The baseline emission rate was multiplied by an agitation factor of 72 to obtain the worst case agitated soil emission rate from the stockpile during excavation activities.

The air emissions resulting from loading a dump truck with a backhoe in Grid 5-4 were calculated based on an agitation factor of 28 provided in Table 27 of Air/Superfund Volume III. The emissions from the agitated soil transported in a dump truck were calculated based on the average exposed area of soil in a dump truck (17 m²) and an estimate of 15 minutes to load a truck (Air/Superfund Volume III). A total emission rate was calculated based on an estimated 28 truck loads per day averaged over an eight-hour operation period.

The estimated emission rates of the compounds from the uncovered stockpile with unagitated or agitated soil, and from the dump

trucks transporting agitated soil are summarized the attached Spreadsheets 2 and 3.

F.1.1.2 Covered Landfill Model

Shen's covered landfill model is used to estimate emission rates of VOCs from stockpiles that are covered with some form of vapor suppressing barrier such as soil, plastic or foam.

Shen's covered landfill model equation is as follows:

$$E = DC_sAP^{4/3}\frac{M}{L}$$

where:

- E = emission rate (g/s)
- D = diffusion coefficient (cm²/sec)
- A = exposed area (cm²)
- C_s = saturation vapor concentration (g/cm³)
- P = soil porosity (unitless)
- M = weight ratio of compound in soil (g/g)
- L = effective depth of soil cover (cm)

The diffusion coefficient, D, was calculated as described in Section F.1.1.1. The saturation vapor concentration is calculated based on the compound vapor pressure molecular weight, molar gas constant and the absolute temperature as presented in Shen's paper. A representative soil

porosity of 0.3 was used for the soil at the Site. It was assumed that the exposed area of the stockpile would be equal to one-third of a grid square (310 m²) and it was assumed that the stockpile would be covered with a 3 mil polyethylene sheet with an effective depth of soil cover equal to one foot.

The compound emission rates calculated using Shen's covered landfill model are presented on the attached Spreadsheets 2 and 3.

F.1.2 AIR DISPERSION MODELING

Air dispersion modeling was conducted in accordance with guidelines provided in the document entitled "Workbook of Atmospheric Dispersion Estimates" (Workbook), B. Turner, U.S. Department of Health, Education and Welfare, Public Health Service Publication No. 999-AP-26 and is approved by USEPA (Table 6 of the Air/Superfund National Technical Guidance Series Volume IV (USEPA), 1989).

The stockpile area in Grid 2-4 was modeled as a virtual point source, as outlined in Turner's Workbook. The emissions from the backhoe excavation activity in Grid 5-4 were assumed to be concentrated at a point source located at the northeast corner of Grid 5-4.

The point source air dispersion model outlined in Turner's Workbook assumes that the plume has a Gaussian distribution in both the horizontal and vertical planes while diffusion in the direction of

plume travel is neglected for a continuous release. The air dispersion model may be expressed as:

$$X = \frac{Q \cdot 10^6}{2\pi S_y S_z u} \text{EXP} \left[\frac{-1}{2} \left(\frac{y}{S_y} \right)^2 \right] \left[\text{EXP} \left[\frac{-1}{2} \left(\frac{z-H}{S_z} \right)^2 \right] + \text{EXP} \left[\frac{-1}{2} \left(\frac{z+H}{S_z} \right)^2 \right] \right]$$

where:

- X = concentration ($\mu\text{g}/\text{m}^3$)
- Q = emission rate (g/sec)
- u = wind speed (m/s)
- S_y = standard deviation of plume concentration distribution in the horizontal direction (m)
- S_z = standard deviation of plume concentration distribution in the vertical direction (m)
- H = height of plume centerline aboveground when it becomes level (m)
- z = receptor height aboveground (m)
- y = lateral distance of receptor from plume centerline (m)

The maximum concentration will occur along the centerline of the plume, therefore, y was set equal to zero. It was assumed that the plume centerline height above ground would be approximately 1 m and the receptor height above ground would be 1 m. The air dispersion model equation also was therefore simplified as:

$$X = \frac{Q \cdot 10^6}{2\pi S_y S_z u} \left[1 + \text{EXP} \frac{-2}{S_z^2} \right]$$

Two receptor locations were considered in the dispersion modeling:

- north of Grid 1-4 at the Site property line
- south of Grid 6-4 at the Site property line

The horizontal and vertical dispersion coefficients S_y and S_z , were determined for an assumed neutral atmospheric stability category (class C). S_y and S_z were determined from figures provided in Turner's Workbook based on the distances from the Grid 2-4 virtual source and the Grid 5-4 point source to the two receptor locations.

A wind speed of 4 m/s was assumed to be representative for the Site. A wind speed of 1 m/s would result in a more conservative estimate of concentration, twice those presented for uncovered stockpiles and four times those for covered stockpiles.

Concentrations of the contaminants were calculated at the two receptor locations for each of the following three air emission source scenarios presented in Section F.1.1:

- i) emissions from an uncovered stockpile in Grid 2-4 (contaminated soil staging area) with unagitated soil;
- ii) emission from an uncovered stockpile in Grid 2-4 with agitated soil;
and
- iii) emissions from backhoe/dump truck operations transporting agitated soil in Grid 5-4.

The air dispersion modeling calculations for the two receptor locations are summarized on the attached Spreadsheets 2 and 3.

SPREADSHEET 1

Project: Summit National Site									
Job No.: 2372									
Re: Chemical Emission and Dispersion Modeling									
Location: Property Line South of Grid 6-4									
Temp (C)=	20	Std Molar Volume (cm^3)=		24055.1496		Vapour			
Wind (m/s)=	4					Pressure			
Polynomial Coefficients For Vapour Pressure Versus Temperature									
(mmHg)									
1,2-dichloroethane	22.994	1.3611	0.031316	0.00019829	6.5353E-06	0	65.374368		
2-butanone	29.062	1.5884	0.036181	0.00046836	3.2547E-06	2.6176E-09	79.5784083		
1,1,1-trichloroethane	36.672	2.0044	0.046246	0.00053158	2.8974E-06	7.7146E-09	99.9993107		
1,1,2,2-tetrachloroethane	1.4733	0.11939	-0.00071719	0.0001659	-8.0264E-07	9.1488E-09	4.80227776		
trichloroethene	21.234	1.195	0.027359	0.00036257	2.9683E-06	5.2045E-09	59.4697424		
2-hexanone	-0.82042	0.31994	-0.014096	0.00045366	-4.3724E-06	3.4557E-08	2.9802584		
4-methyl-2-pentanone	1.2463	0.16983	-0.0039324	0.0002974	-1.8656E-06	2.7959E-08	5.2401128		
tetrachloroethene	9.2792	-0.38304	0.035286	-0.00032697	4.0314E-06	0	13.762064		
toluene	6.7686	0.42072	0.011858	0.00019278	1.4698E-06	4.889E-09	21.7192528		
ethylbenzene	1.7926	0.1312	0.0053377	3.3956E-05	1.3736E-06	1.7678E-09	7.04876096		
xylene(s)(tot)	1.4188	0.097598	0.0050315	2.1695E-05	1.1721E-06	2.3123E-09	5.75185536		
methylene chloride	137.49	6.7296	0.13209	0.0013946	1.0784E-05	5.5474E-08	337.977757		
acetone	67.547	3.577	0.075994	0.00082883	6.9589E-06	4.7507E-08	177.380686		
1,1-dichloroethane	69.823	3.6105	0.074709	0.00078119	5.9985E-06	3.8406E-08	179.248779		
trans-1,2-dichloroethene	101.01	5.0626	0.10527	0.0012298	8.0763E-06	0	255.500608		
chloroform	58.835	3.1184	0.071447	0.00085619	3.7840E-06	-1.053E-08	157.203058		
SHEN'S OPEN LANDFILL AIR EMISSIONS MODEL									

SPREADSHEET 2

UNAGITATED AND AGITATED STOCKPILE EMISSIONS AND DOWNWIND CONCENTRATIONS						SHEN'S COVERED LANDFILL MODEL			
	Baseline	Baseline	Maximum	Agitated Stockpile	Unagitated Stockpile	Soil Porosity=	0.3	Cover (cm)=	30
	Emission	Emission	Agitated	Downwind Concentration	Downwind Concentration	Area (cm^2)=	3097600		
Compound	(g/sm^2)	(g/s)	Emission(g/s)	(ug/m^3)	(ug/m^3)	Emission Rate		Downwind Concentration	
						(g/s)		(ug/m^3)	
1,2-dichloroethane	3.4907E-05	0.01081778	0.77888019	2707.2669	37.6009292	5.3469E-05		0.18585021	
2-butanone	1.4558E-05	0.00451157	0.32483294	1129.06901	15.681514	2.2116E-05		0.07687112	
1,1,1-trichloroethane	4.3108E-05	0.01335931	0.96187063	3343.31333	46.4349073	6.1781E-05		0.2147414	
1,1,2,2-tetrachloroethane	2.1426E-07	6.64E-05	0.00478077	16.617214	0.23079464	2.9382E-07		0.00102127	
trichloroethene	7.9393E-05	0.02460389	1.77148003	6157.39021	85.5193085	0.00011489		0.39933706	
2-hexanone	7.9164E-08	2.4533E-05	0.00176636	6.13960993	0.08527236	1.0858E-07		0.00037741	
4-methyl-2-pentanone	1.4236E-06	0.00044116	0.03178339	110.404642	1.5333978	1.9525E-06		0.00678664	
tetrachloroethene	6.3933E-07	0.00019813	0.01426516	49.5834997	0.68865972	8.8369E-07		0.00307156	
toluene	3.2498E-05	0.01007126	0.72513079	2520.44234	35.0061435	4.6187E-05		0.16053919	
ethylbenzene	8.4966E-06	0.0026331	0.18958291	658.960847	9.15223399	1.1144E-05		0.03873553	
xylenes(tot)	2.6634E-05	0.0082539	0.5942806	2065.62731	28.6892682	3.6211E-05		0.1258638	
methylene chloride	3.6941E-05	0.01144793	0.82425119	2864.96948	39.7912427	5.9956E-05		0.20899824	
acetone	3.8395E-05	0.01189859	0.85669825	2977.75042	41.3576448	6.2605E-05		0.21760683	
1,1-dichloroethane	1.5394E-05	0.00477054	0.34347904	1193.87994	16.5816658	2.3338E-05		0.08111854	
trans-1,2-dichloroethene	9.6859E-06	0.00300166	0.21611941	751.197586	10.4332998	1.4173E-05		0.04926401	
chloroform	5.3992E-06	0.0016732	0.1204704	418.736452	5.81578406	8.1648E-06		0.02837948	
BACKHOE ACTIVITY EMISSIONS AND DOWNWIND CONCENTRATIONS						Total Downwind Concentrations			
	Baseline Emission		Agitated Emission	Agitated Emission While	Agitated Emission Averaged Over	Agitated Truck		(Agitated Truck + Agitated	
Compound	(g/s/m^2)		(g/s/m^2)	Loading One Truck (g/truck)	8 Hours For 28 Truck loads (g/s)	Downwind Concentrations		Stockpile)	
						(ug/m^3)		(ug/m^3)	
1,2-dichloroethane	3.4907E-05		0.00097741	14.9542985	0.0145389	8.51798964		2715.78489	
2-butanone	1.4558E-05		0.00040763	6.23670867	0.00606347	3.5524381		1132.62144	
1,1,1-trichloroethane	4.3108E-05		0.00120704	18.4676677	0.01795468	10.5192097		3353.83254	
1,1,2,2-tetrachloroethane	2.1426E-07		5.9993E-06	0.09178954	8.924E-05	0.05228345		16.6694975	
trichloroethene	7.9393E-05		0.002223	34.0119592	0.03306718	19.3732602		6176.76347	
2-hexanone	7.9164E-08		2.2166E-06	0.03391375	3.2972E-05	0.01931732		6.15892724	
4-methyl-2-pentanone	1.4236E-06		3.9859E-05	0.60984898	0.00059291	0.34737085		110.752012	
tetrachloroethene	6.3933E-07		1.7901E-05	0.27388746	0.00026628	0.15600669		49.7395063	
toluene	3.2498E-05		0.00090996	13.9223241	0.01353559	7.93017552		2528.37251	
ethylbenzene	8.4966E-06		0.0002379	3.63994301	0.00353883	2.0733167		661.034164	
xylenes(tot)	2.6634E-05		0.00074575	11.410034	0.01109309	6.49917155		2072.12648	
methylene chloride	3.6941E-05		0.00103434	15.8254101	0.01538582	9.01417601		2873.98365	
acetone	3.8395E-05		0.00107506	16.4483852	0.01599149	9.36902352		2987.11945	
1,1-dichloroethane	1.5394E-05		0.00043103	6.59470885	0.00641152	3.75635551		1197.63629	
trans-1,2-dichloroethene	9.6859E-06		0.00027121	4.14943681	0.00403417	2.36352509		753.561111	
chloroform	5.3992E-06		0.00015118	2.31300058	0.00224875	1.31748841		420.05394	
			Sum=	148.983316	Sum=	0.14484489			

SPREADSHEET 3

UNAGITATED AND AGITATED STOCKPILE EMISSIONS AND DOWNWIND CONCENTRATIONS						SHEN'S COVERED LANDFILL MODEL					
		Baseline	Baseline	Maximum	Agitated Stockpile	Unagitated Stockpile		Soil Porosity=	0.3	Cover (cm)=	30
		Emission	Emission	Agitated	Downwind Concentration	Downwind Concentration		Area (cm^2)=	3097600		
Compound		(g/sm^2)	(g/s)	Emission(g/s)	(ug/m^3)	(ug/m^3)		Emission Rate		Downwind Concentration	
								(g/s)		(ug/m^3)	
1,2-dichloroethane		3.4907E-05	0.01081778	0.77888019	425.506172	5.90980794		5.3469E-05		0.02921042	
2-butanone		1.4558E-05	0.00451157	0.32483294	177.457875	2.4646927		2.2116E-05		0.01208198	
1,1,1-trichloroethane		4.3108E-05	0.01335931	0.96187063	525.474771	7.29826071		6.1781E-05		0.0337513	
1,1,2,2-tetrachloroethane		2.1426E-07	6.64E-06	0.00478077	2.61175842	0.03627442		2.9382E-07		0.00016051	
trichloroethene		7.9393E-05	0.02460389	1.77148003	967.768467	13.4412287		0.00011489		0.06276455	
2-hexanone		7.9164E-08	2.4533E-05	0.00176636	0.96497391	0.01340242		1.0858E-07		5.9318E-05	
4-methyl-2-pentanone		1.4236E-06	0.00044116	0.03176339	17.3525028	0.24100698		1.9525E-06		0.00106667	
tetrachloroethene		6.3933E-07	0.00019813	0.01426516	7.79313082	0.10823793		8.8369E-07		0.00048276	
toluene		3.2498E-05	0.01007126	0.72513079	396.142608	5.50198066		4.6187E-05		0.02523224	
ethylbenzene		8.4966E-06	0.0026331	0.18958291	103.570101	1.43847363		1.1144E-05		0.00608814	
xylenes(tot)		2.6634E-05	0.0082539	0.5942806	324.658484	4.50914562		3.6211E-05		0.01978225	
methylene chloride		3.6941E-05	0.01144793	0.82425119	450.292579	6.2540636		5.9956E-05		0.03275434	
acetone		3.8395E-05	0.01189859	0.85669825	468.01857	6.50025792		6.2605E-05		0.03420167	
1,1-dichloroethane		1.5394E-05	0.00477054	0.34347904	187.644329	2.60617124		2.3338E-05		0.01274955	
trans-1,2-dichloroethene		9.6859E-06	0.00300166	0.21611941	118.067121	1.63982113		1.4173E-05		0.00774292	
chloroform		5.3992E-06	0.0016732	0.1204704	65.8135866	0.91407759		8.1648E-06		0.00446046	
BACKHOE ACTIVITY EMISSIONS AND DOWNWIND CONCENTRATIONS											
										Total Downwind Concentrations	
		Baseline Emission		Agitated Emission		Agitated Emission While		Agitated Emission Averaged Over		Agitated Truck	
		(g/s/m^2)		(g/s/m^2)		Loading One Truck (g/truck)		8 Hours For 28 Truck loads (g/s)		Downwind Concentrations	
Compound										Stockpile)	
										(ug/m^3)	
1,2-dichloroethane		3.4907E-05		0.00097741		14.9542985		0.0145389		34.8860683	460.39224
2-butanone		1.4558E-05		0.00040763		6.23670867		0.00606347		14.5492779	192.007153
1,1,1-trichloroethane		4.3108E-05		0.00120704		18.4676677		0.01795468		43.0822158	568.556987
1,1,2,2-tetrachloroethane		2.1426E-07		5.9993E-06		0.09178954		8.924E-05		0.21413081	2.82588924
trichloroethene		7.9393E-05		0.002223		34.0119592		0.03306718		79.3446465	1047.11311
2-hexanone		7.9164E-08		2.2166E-06		0.03391375		3.2972E-05		0.07911553	1.04408943
4-methyl-2-pentanone		1.4236E-06		3.9859E-05		0.60984898		0.00059291		1.42268347	18.7751862
tetrachloroethene		6.3933E-07		1.7901E-05		0.27388746		0.00026628		0.63893713	8.43206795
toluene		3.2498E-05		0.00090996		13.9223241		0.01353559		32.4786313	428.621239
ethylbenzene		8.4966E-06		0.0002379		3.63994301		0.00353883		8.49142472	112.061526
xylenes(tot)		2.6634E-05		0.00074575		11.410034		0.01109309		26.6178467	351.276331
methylene chloride		3.6941E-05		0.00103434		15.8254101		0.01538582		36.9182369	487.210816
acetone		3.8395E-05		0.00107506		16.4483852		0.01599149		38.3715416	506.390112
1,1-dichloroethane		1.5394E-05		0.00043103		6.59470885		0.00641152		15.384437	203.028766
trans-1,2-dichloroethene		9.6859E-06		0.00027121		4.14943681		0.00403417		9.67999507	127.747116
chloroform		5.3992E-06		0.00015118		2.31300058		0.00224875		5.39587303	71.2094597
					Sum=	148.983316	Sum=	0.14484489			